

No. 11019

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United States  
Circuit Court of Appeals  
For the Ninth Circuit.

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THE PERMANENTE METALS CORPORATION, a corporation,  
Appellant,  
vs.

B. PISTA AND MARIE PISTA,  
Appellees.

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Transcript of Record  
In Two Volumes  
VOLUME II  
Pages 377 to 727

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Upon Appeal from the District Court of the United States  
for the Northern District of California,  
Southern Division

FILED

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PAUL P. O'BRIEN,  
CLERK



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Friday, September 15, 1944,  
10:00 O'clock A. M.

The Clerk: Pista vs. Permanente Metals.

Mr. Moore: I mentioned yesterday, your Honor, that I had several witnesses from out of town whom I would like to put on the stand out of order.

Mr. Naus: I have informed Mr. Moore, particularly in view of transportation, hotel conditions, and the like, that I would leave it entirely in his hands, the order of his witnesses, or whether he draws any temporarily from time to time. He can have it just as he pleases.

Mr. Moore: Thank you. Before calling them, I showed Mr. Naus yesterday certain documents which he has had a chance to examine, and he says he makes no objection to their introduction.

Mr. Naus: I would say, Mr. Moore, there was one document of several pages which you gave me full opportunity over night to have in my possession and study, and I told you this morning if you decided to offer it I would make no objection to it.

Mr. Moore: We will offer this, if your Honor please. I will have it marked and then I will state in general what it is without detailing it.

(The document was marked Defendant's Exhibit L in evidence.)

Mr. Moore: This document, which consists of some seven pages, with accompanying maps or diagrams, is from the War De- [291] partment of the United States Government. There is a letter of enclosure which is dated May 14, 1942, addressed

to the Permanente Metals Corporation, 1522 Latham Square Building, Oakland, California.

“Subject: Necessity certificate, File No. WD-N7455 Date of Issue: May 12, 1942”

This letter states in substance that there is transmitted a certificate issued by direction of the Undersecretary of War pursuant to section 124 of the Internal Revenue Code, Title III, section 302 of the Second Revenue Act of 1940, as amended, in response to your application therefor.”

It states that,

“The original of this certificate has been transmitted on this date to the Commissioner of Internal Revenue.”

This is signed by J. T. Ashworth, First Lieutenant, Specialist, George H. Foster, Lieutenant Colonel, Signal Corps, Chief, Tax Amortization Section, Fiscal Division.

Accompanying that is a document dated May 12, 1942, bearing the same number, WD-N7455, headed, “War Department, Necessity Certificate.

“To the Commissioner of Internal Revenue:

“Pursuant to section 124 of the Internal Revenue Code, particularly subsection (f) thereof, and in response to the application filed by the Permanente Metals Corporation, Oakland, California. [292]

“It is hereby certified that the facilities described in the attached Appendix A (consisting of five pages and two drawings) are necessary in the interest of national defense dur-

ing the emergency period, up to 100 percent of the cost attributable to the construction, reconstruction, erection, installation or acquisition thereof, and that the application for this certificate was filed on March 30, 1942.

“By direction of the Undersecretary of War:

GEORGE H. FOSTER,

Lieutenant Colonel, Signal Corps, Chief, Tax Amortization Section.

“Certified true copy, signed, J. T. Ashworth, First Lieutenant, Specialist, Office Assistant, Tax Amortization Division.”

Accompanying that is a copy of the application as Appendix A, on which the name of the corporation is stated, the location of the facilities, there is a legal description of the property, which is in Monterey County, and the quarry property. Accompanying also as a part of the exhibit is a summary of estimated cost of this particular plant, which covers, without detailing them or the amounts—I do not think that is necessary—the quarry equipment, the raw materials preparation, kiln department, utilities, including water supplies, administration building, warehouse building, finished material storage, repair shop, railroad spur, general, portable tools and equipment, quarry [293] property; also auxiliary equipment, piping, wiring, buildings, and machinery, and accompanying are two drawings which are part of the exhibit.

Mr. Naus: If the Court please, I will state on examining that, or I think your Honor on ex-

amining it will find what it amounts to is this—this is my theory of it anyway, Mr. Moore is not bound by it: Under the Second Revenue Act of 1940, enacted in October, 1940, there was added to the Internal Revenue Code a new section numbered 124. It had to do with the matter of amortizing depreciation, obsolescence and the like. It gave to any person who acquired or owned a plant an election either to claim his depreciation, obsolescence and the like under the ordinary rules over a long period of years, or at his election, to come in under this section to establish or claim a right to advertise over a period of 60 months, a short period of 60 months rather than the ordinary period under the normal sections. To make one eligible under that section to elect to amortize over a period of 60 months, one of the subdivisions of the section required a particular type of certificate from either the Secretary of War or the Secretary of the Navy. This document Mr. Moore has offered in evidence is, I take it, the certificate of the Secretary of War to make Permanente Metals, a corporation, eligible under that section.

The Court: You might indicate the purpose of this offer for the record. [294]

Mr. Moore: The purpose of the offer, your Honor, is to show that this particular operation is under the United States Government a war emergency function that is being carried on at Natividad.

The Court: I anticipated that, but I wanted the record to disclose it.

Mr. Naus: I have no doubt, if the Court please, that the certificate establishes that this entire plant, everything making it up, is an emergency facility within the meaning of that term as used in that section, and being such, I have no doubt that the plant was built at or about the time it was stated, and as part of our defense preparedness.

The Court: All right.

Mr. Moore: I will call Mr. Wilmoth.

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J. J. WILMOTH,

called as a witness by defendant; sworn

Direct Examination

Mr. Moore: Q. Your name is—

A. J. J. Wilmoth.

Q. Where do you live, may I ask?

A. I live near Salinas, about six miles out.

Q. Do you live in the neighborhood of Natividad? A. I do.

Q. How long have you lived in that vicinity?

A. I practically lived there my lifetime, about 60 years.

Q. Did you own in 1943 an apricot orchard in that vicinity? [295] A. I did.

Q. Did you own it in 1944? A. I did.

Q. Can you tell us with relation to the plant of the Permanente Metals Corporation approximately where your apricot ranch was located?

A. I think it was about a mile and a half or a little better west of the plant.

(Testimony of J. J. Wilmoth.)

Q. How large an apricot ranch did you have?

A. I have about 10 acres in apricots alone—about 10 acres.

Q. Of apricots alone? A. Yes.

Q. How long have you been engaged in apricot ranching or farming?

A. Oh, about 20 years.

Q. How long did you own this particular ranch?

A. Well, I lived on this particular ranch 45 years and I have owned it since 1927.

Q. Your life has been given to agricultural pursuits, is that correct? A. Yes.

Q. What is your normal yield from that ranch over the years? How much would it produce per acre? You say there are 10 acres there.

A. I think it runs about 60 tons a year, some years 50, some years 70.

Q. You mean for the 10 acres? A. Yes.

Q. In other words, five to six to seven tons per acre, is that correct? A. Yes.

Q. That is your customary and usual crop that you have taken off of that orchard?

A. I took off 55 tons in 1942 and I took off about 75 tons this year, 1944. [296]

Q. This year was a very good year?

A. It was.

Q. What did you take off in 1943?

A. I took off about 10 percent of that, about 6 tons.

Q. In other words, from the 10 acres you took

(Testimony of J. J. Wilmoth.)

off about 6 tons, approximately a half a ton an acre, is that correct?

A. Something like that. I imagine it would be.

Q. Was there any dust that you know of that came from Permanente Metals Corporation onto your property?

A. Not that I can say in 1942. In 1943 I didn't see any.

Q. In other words, so far as your property was concerned, which you say is about a mile and a half from the plant, you did not observe any dust deposit in 1943?

A. Well, no, not in 1943. I did notice a little in 1942, just a small amount.

Q. But you did not observe any in 1943?

A. No.

Q. The year you had your short crop?

A. No.

Q. Will you describe to his Honor the blossoming period in 1943 and the description of the weather, the weather conditions generally during the whole period of pollinization, and what happened to the fruit that was in your orchard?

A. I think it was on account of the weather more than anything else that ruined my crop. My crop was in full bloom. I sprayed it about the 1st of March. It commenced to rain. It rained about ten days. It turned out foggy and damp and rotted the blossoms.

Q. Out of your experience you would say that

(Testimony of J. J. Wilmoth.)

your short crop in that year was due to weather conditions?

A. I presume it [297] was, yes.

Q. That is your opinion, that is your view?

A. It was in my particular case, yes.

Mr. Moore: I think that is all.

#### Cross-Examination

Mr. Naus: Q. Mr. Wilmoth, what is the nearest point of the 10 acres of apricots that you have to the stacks of the Permanente plant at Natividad?

A. That I couldn't say, but I think it is somewhere within a mile and a half, something like that.

Q. About a mile and a half away? A. Yes.

Q. The nearest point of your 10 acres to the stacks of the Permanente plant, is that correct?

A. I think so, yes, something like that.

The Court: Do you recall the range of the dust, the testimony with relation to the area it covered?

Mr. Naus: Pardon me?

The Court: Do you recall the testimony of—

Mr. Naus: Dr. Duschak? Yes, I have that in mind.

The Court: Did that cover this area?

Mr. Naus: Yes, presumably. It is not entirely clear. I will ask the doctor more about it. I would rather not discuss the details in front of the witness, but I have it clearly in mind.

Q. What is the distance of the furthest part

(Testimony of J. J. Wilmoth.)

of your 10 acres of apricot orchard from the stacks of the Permanente plant? [298]

A. That is pretty hard to say. It would be across the orchard, which covers about 10 acres.

Q. I do not know the shape of the orchard.

A. Well, my orchard is square—a couple of hundred yards, probably.

Q. A couple of hundred yards across the orchard?

A. The furthest part of the orchard, yes.

Q. Then you would add about a couple of hundred yards to the mile and a half, is that correct?

A. Yes.

Q. What is the distance between the nearest part of your 10 acres of apricots to the nearest part of Mr. Pista's 44 acres of apricots?

A. Well, I am somewhat nearer—I presume about a half mile nearer.

Q. You say you are a half mile nearer the Permanente stacks?

A. Well, I should say I am about a mile.

Q. A mile?

A. A mile nearer than Mr. Pista's.

Q. You say you are nearer the stacks or he is nearer?

A. He is nearer, about a half a mile, I presume—about a half a mile.

Q. You presume. Is that your best estimate on the distance that you are farther away from the stacks than Pista?

(Testimony of J. J. Wilmoth.)

A. Well, yes. I am a mile and a half at the least. I never measured it. I don't know, really, but I judge.

Q. I might state that the maps that we have here and the evidence we have here indicates Mr. Pista's orchard is not more than a half mile from those stacks.

A. That is right. That is the [299] way I would figure it out.

Q. You are a mile away from them?

A. Yes.

Q. In other words, there is roughly a half mile to a mile from your orchard to his? A. Yes.

Q. Are you or not in the same general direction by the compass, let us say, from the stacks that he is? A. No, I am more west.

Q. I show you a map here designated Plaintiffs' Exhibit 1. Here is the old stage road coming along here. Down here is the plant where the stacks are, and this parcel over here that is closed in is Mr. Pista's orchard, showing Gabilan creek flowing through, and this arrow over here points to north. Will you indicate whereabouts with respect to this map your apricot orchard is?

A. Well, I think I am laying in this direction somewhere.

Q. You mean toward the south of Pista?

The Court: I think you have him confused on this.

Mr. Naus: Perhaps so.

(Testimony of J. J. Wilmoth.)

Q. You see, this direction from Pista would be southwest.

A. Well, that is about—I figure about west.

Q. May I state this: You see this points over here to north. A. Yes.

Q. So at right angles to that this way would be due west, see? Are you out this way from Pista?

A. No, I am not—I am west from Pista's orchard, as near as I can figure it out. This is Pista's orchard? [300]

Q. Yes, this whole place enclosed in here.

A. I am in this direction somewhere. Pista comes across this way.

Q. Are you west of the old Los Angeles Stage Road, here? A. Yes.

Q. Could you say how far west of the old Los Angeles Stage Road you are?

A. Well, the old stage road—

Q. Yes, the one running by the Permanente plant.

A. Well, here is the highway coming here, and I am right on this highway.

Q. Let me ask you whether it takes a different direction of wind from the Permanente stack to reach your place than it does to reach Mr. Pista's place?

A. Well, I think it would, yes.

Q. You did observe, you said, some dust falling on your place in 1942?

(Testimony of J. J. Wilmoth.)

A. I could see traces of it on new wood, on new growth.

Mr. Naus: May I proceed, Mr. Moore?

Mr. Moore: I was just looking for an exhibit that I find on your desk.

Mr. Naus: Mr. Harrington could have helped you on that. I was in the middle of cross-examination.

Mr. Moore: I did not intend to interrupt you.

Mr. Naus: But you did. May I have the last question and answer read?

(Record read.)

(A map was displayed by Mr. Moore to Mr. Naus.)

Mr. Naus: Mr. Moore, couldn't we keep this document until later?

Mr. Moore: I thought you wanted the map.

Mr. Naus: I do, but I want the map less than I want the interruption. We can come to that. Besides, there will be redirect coming.

(Question and answer re-read.)

Mr. Naus: Q. Was that toward the end of 1942?

A. I think along about in February, sometime.

Q. 1942?

A. Yes, along in pruning time. Now, I prune around in February, somewhere along in there.

Q. I am thinking of the year 1942, and not of the year 1943, and not of the year 1944. You know which year I am speaking of?

(Testimony of J. J. Wilmoth.)

A. I am speaking about 1942, yes.

Q. Now, you prune along in February of the year, do you?

A. I commence along in February and prune probably to the first of March.

Q. When you say "along in February," do you mean you start pruning in November, 1942 and carried it into February, 1943, or do you mean you started in November, 1941 and continued into February, 1942?

A. I started in 1941 evidently and finished in 1942.

Q. When did that plant start operation, do you know?

A. I don't know, really. I think it started sometime in 1940. I wouldn't say positive, because I never kept no record of it.

Q. This white something or other I think you mentioned as being on new wood, you meant what by new wood?

A. It would be a new growth of wood. [302]

The Court: Q. On the fruit trees?

A. Yes.

Mr. Naus: Q. On the fruit trees.

A. Clean wood where you could notice it. You couldn't notice it on rough bark. You could only notice it on clean wood, new wood.

Q. It was white, was it? A. Yes.

Q. With the dust? A. Yes.

Q. Did it crust onto the wood?

(Testimony of J. J. Wilmoth.)

A. Not enough to notice it, that is, not enough to mean anything at all. I could just see traces of it.

Q. What I am getting at is, the white you did see on the wood, was it crusted on the wood, what you could see?

A. You could take your finger and rub it off. That is why I knew it was dust.

Q. What is the latest date or month that you ever observed any trace of dust from the Permanente plant on any part of your apricot orchard?

A. Well, that was along about that time of year. That was about the last I ever noticed any.

Q. State the month and the year that you fix as the last time you ever noticed any dust on any part of your apricot orchard.

A. I think it was along about 1942, along in February, sometime.

Q. Along about February, 1942? Have you ever noticed any dust on any of your neighbors' property, like Mr. Pista's, or Mr. Anderson's?

A. I have noticed it, yes.

Q. Was there much of the dust that you could notice? [303]

A. You could notice it was white. As nearly as I could see it was white.

Q. Mr. Wilmoth, I was not asking so much the color of it as the quantity or amount of it. Did you notice much of it on either Anderson's or Pista's orchard?

(Testimony of J. J. Wilmoth.)

A. I couldn't say the amount of it. I have no way of determining the amount.

Q. Did you see it on the wood of the apricot orchard, on the leaves, the buds, or anything like that?

A. You could see it on the leaf. You could see it was white.

Q. Much of it? A. It was noticeable, yes.

Q. In the year 1943 when did apricot blossoms come out, and how long did the apricots bloom continually.

A. Well, they continued on for about three weeks, I think, from the beginning to the end.

Q. Beginning when and ending when?

A. Well, it began about February 1st and ended somewhere, well, about February 15th, I think, because I sprayed March 1st—about two weeks blooming season.

Q. I am trying to find when the blooming season began and when it ended as best he can recall.

A. I figured about the middle of February, 1942 when they began and they ended, after the rain, the first of March.

Q. You say February of 1942. I was asking you about the next year, 1943.

A. I am mistaken there. It is 1943 I am speaking of. [304]

Q. Then, as I understand it, you say that the apricot blooming began about the middle of February, 1943, and ended about the end of February, 1943?

(Testimony of J. J. Wilmoth.)

A. I think it ended—they were in full bloom the first of March, 1943, because I sprayed the first day of March.

Q. Well, you sprayed it while it was in full bloom, did you? A. Absolutely, yes.

Q. What did you spray it with?

A. Bordeaux, lime and bluestone.

Q. What is commonly known as the Bordeaux mixture, is it? A. Yes.

Q. You sprayed your orchard in the year 1943, while it was in full bloom, did you?

A. That is right.

Q. Is that your practice each year?

A. As near as I can get at it. That year they came out in bloom pretty early, almost at one time. They didn't linger long as they usually do.

Q. I am asking you simply if it was your practice each year like in 1941 and 1942 and 1943 and 1944 to spray your apricot orchard when it was in full bloom?

A. Well, you are supposed to spray it at a certain stage. You are supposed to spray it when it is in what you call a popcorn stage, between—just about the time they are ready to burst open and bloom.

Q. I am not asking you, Mr. Wilmoth, what you are supposed to do. I am asking you whether in fact you sprayed your orchard in each of the years I mentioned while the apricot orchard was in full bloom?

(Testimony of J. J. Wilmoth.)

A. I don't try to spray it in full bloom. I try to catch it as near as I can in between—not when it is in [305] full bloom, that would be everything in bloom—you can't do that. It is not possible to do it. You catch it probably some just coming in bloom, some in full bloom, and some through blooming.

Q. You spray it in various stages of blooming?

A. You can, yes.

Q. I am not asking you if you can; I am asking you if you do.

A. That is what I endeavor to do, yes, catch it—

Q. Not what you endeavor to do; did you in fact spray that way in those years?

A. Well, I could say yes.

The Court: Q. One spraying in the blooming period?

A. Yes. Some sprays twice, but I don't—

Q. I am just asking you about what you did. You just spray once? A. Yes.

Mr. Naus: Q. You have done it the same way for a number of years back, have you?

A. Yes.

Q. Do other apricot growers in the neighborhood do it the same way?

A. I think they mostly do, yes, because I notice we always spray about the same time.

Q. Does the company that sells the spray give you assistance in suggesting when the spraying should be done?

(Testimony of J. J. Wilmoth.)

A. Well, I imagine a man in the fruit business twenty years should know about when to spray. At least, he ought to know about when to do it.

Q. That does not quite answer the question. I am asking you if a man from the spray company does in fact make suggestions to [306] you.

A. They probably have in time, but I don't recall any.

Q. You go along with the idea, then, as I understand it, that anyone who has been in the apricot business for twenty years knows when to spray?

A. Well, he should.

Q. That includes Mr. Pista, doesn't it?

A. Yes.

Q. Is Mr. Pista's spraying back through the years any different from your own, so far as you know?

A. So far as I know not. They are about the same.

Q. So far as you know, has spraying of apricot orchards in that neighborhood with Bordeaux mixture, ever prevented or interfered with the fruit setting? A. No, I think it is beneficial.

Mr. Naus: Now, Mr. Moore, you wanted to point out something on this map. Perhaps we could come to an understanding with the witness about it.

Mr. Moore: Mr. Naus, you were examining him about the location of his ranch. This is a map of Monterey and San Benito Counties, and if you desire, you might ask him to spot his ranch on it.

(Testimony of J. J. Wilnoth.)

Mr. Naus: Well, if he can. Would you mark this for identification, Mr. Welsh?

(The map was marked Plaintiffs' Exhibit 12 for Identification.)

Mr. Naus: This is a map of Monterey and San Benito Counties, put out by Thomas Bros., well-known map makers in the community, and it gives sections, township numbers and the like. [307]

Q. Would it be possible for you to spot or to indicate on that map where your orchard is located?

A. If I can get a line on this map, I may.

Q. Just look it over.

A. It is approximately right in here somewhere (indicating).

Q. Could you take a pencil, please, and mark on there? Do you want to rest that on something? Here is a blue pencil. Perhaps that will bring it out better.

A. Natividad—I can't locate—which way is this going, north or south?

Q. The top of the map is due north. Here is the legend over here. Up and down is north and south.

The Court: Do either of you know where this ranch is?

Mr. Naus: I couldn't spot his. I do not know whether Mr. Moore can, or not.

Mr. Moore: We have it spotted here.

The Witness: I lay right in here, somewhere. I couldn't say definitely. Between Lagunita and Santa Rita.

(Testimony of J. J. Wilmoth.)

Mr. Naus: Q. You lay between where?

A. Lagunita and Santa Rita, on the main highway.

Q. Would you draw a blue line on that highway you are speaking of from Lagunita to Santa Rita?

The Court: Since there cannot be any question about the location of this ranch, it seems to me we are wasting time.

Mr. Naus: I do not know where his ranch is located.

The Court: Since there is no question about it there ought [308] to be a stipulation entered into.

Mr. Naus: Can you spot it on this map, Mr. Moore?

Mr. McCarthy: I think we have it here.

Mr. Naus: Mr. McCarthy, can it be spotted on this map, here? Can one of you gentlemen spot it?

Mr. McCarthy: We are just trying to.

Mr. Moore: We will pass it for the moment. I think we can.

Mr. Naus: Subject to spotting it, you may take the witness.

Can you mark this as well as the other one, Mr. Clerk, since they have it spotted? Please, Mr. McCarthy, I want to hear what you are saying to the witness.

May we make the substitution, please, in view of the spotting being on the other map?

The Court: Very well.

Mr. Naus: Q. I show you a map here, and it

(Testimony of J. J. Wilmoth.)

is suggested by the attorneys for Permanente that this mark over here is where your ranch is located, is that correct?

A. That is where I figure, just about in there.

Q. May I circle that and mark it?

A. That is as far as I can read that map.

Mr. Naus: If the Court please, I will encircle that, run off to the side, and mark it "W. 1." That is all.

#### Redirect Examination

Mr. Moore: Q. Mr. Wilmoth, do the orchards in that vicinity all come into bloom at the same time, or is there some [309] variation?

A. There is a variation on older fruit and young trees. I know that.

Q. Could you explain that?

A. That I couldn't very well do.

Q. Do the younger trees come into bloom earlier? A. Later in bloom.

Q. Later than the older trees. Is the blooming period affected in any way by the climatic conditions of this particular ranch, if you know?

A. I think the weather has a great deal to do with it at the time of blooming. This year they were coming in late because of the cold winter we had.

Q. In other words, the time of blooming is affected a good deal by the weather conditions, is that correct? A. I think so, yes.

Q. Has it been your observation of the ranches

(Testimony of J. J. Wilmoth.)

that are located in different vicinities that they all come into bloom at the same time, or is there some variation?

A. I think a warmer climate, or where they are located makes some difference, yes.

Q. That has been your observation, there is some variation? A. Yes.

Q. Are you acquainted at all with the so-called Bardin ranch?

A. I know where it is located, yes.

Q. What is its characteristic so far as weather conditions are concerned?

A. As far as I know, it is further south, and it is evidently a good deal warmer there and less fog.

Q. That is your view, is it?

A. That would be it, yes. [310]

Q. Where the Pista ranch is located, is that subject to fog and cloudy weather?

A. It is right near me, there. I have about the same kind of weather. They have the fog there the same as I do.

Q. It is your opinion as a man who has been engaged in the business that the short crop that you had in 1943 was due to the weather, is that correct?

A. I don't see what else it could be.

Mr. Moore: That is all.

Mr. Naus: No further questions.

The Court: Step down.

WILLIAM D. EIPER,

called as a witness by defendant; sworn

The Clerk: Q. Your name, please?

A. William D. Eiper.

Direct Examination

Mr. Moore: Q. Mr. Eiper, where do you live, may I ask?

A. I live in the Aromas section.

Q. What county is that?

A. Well, I live in San Benito County, but it is right close to the junction of Monterey and Santa Cruz Counties.

Q. How long have you lived there?

A. I have lived there since 1915.

Q. What business are you engaged in?

A. I have been raising apricots. [311]

Q. How long have you been engaged in the raising of apricots?

A. Well, I planted this orchard in 1915.

Q. In other words, from 1915 to 1944 that has been your livelihood, this orchard, is that correct?

A. Yes, sir.

Q. You have devoted your time to that business? A. Yes, sir.

Q. Have you any connection with the Prune & Apricot Growers Association?

A. Yes, I have been a member ever since we had fruit to ship.

Q. Are you at the present time connected with that in any official capacity?

A. I am secretary of the Aromas Local.

(Testimony of William D. Eiper.)

Q. Of what? A. Of the Aromas Local.

Q. In other words, the Prune & Apricot Growers Association is divided up into certain locals; that means some particular community?

A. That is right.

Q. In that particular community where you reside you are the secretary of that particular local, is that correct? A. It is.

Q. How many acres have you in apricots?

A. I have 20 acres.

Q. That is located where?

A. Well, it is located in San Benito County, right near the junction of Monterey and Santa Cruz Counties, near what they call the Tri-County Bridge.

Q. Do you know where this plant of Permanente Metals is located at Natividad? A. I do.

Q. Approximately how far distant from that plant would say your orchard is?

A. I think about 12 miles.

Q. Have you at any time ever seen any indication of the dust [312] from that plant on your orchard? A. No, sir.

Q. To the best of your knowledge, there has been no dust deposited on your orchard from that plant; would that be your statement?

A. It is.

Q. What has been your normal crop from those 10 acres of apricots that you have over the years? I mean what yield is your normal crop?

(Testimony of William D. Eiper.)

A. It varies greatly, but I think about 60 tons would be an average crop.

Q. That is about 6 tons to the acre, is that correct?

A. No, sir. It would be about 3 tons to the acre.

Q. What crop did you have this year, may I ask? A. This year I had 110 tons.

Q. You had 110 tons this year. This was a very good year, was it not?

A. It was, next to the best I have had.

Q. In 1943 what was your crop there?

A. In 1943 I had about 4 ton of green fruit.

Q. 4 tons from the entire orchard, is that correct? A. That is correct.

Q. Perhaps you can perform the computation. About how much per acre was that?

A. It would be about a fifth of a ton an acre.

Mr. Naus: That is mathematical, Mr. Moore.

Mr. Moore: Q. Do you know from your actual observation of your orchard and your knowledge of the orchard business what caused that short crop on your orchard in 1943?

A. Well, I would say it was the rain. We had a long rainy period when they [313] were in blossom.

Q. Will you describe that to his Honor?

A. Well, just about the time that the fruit trees were in full blossom, it started to rain, and it rained, I guess, for about, oh, two weeks, and the blossoms just dropped off. The little fruit never set.

(Testimony of William D. Eiper.)

Q. You were there day and night and observed the process, did you?

A. I was there every day, in bed at night.

Q. Your short crop, in your opinion, was caused purely by the weather conditions and climatic conditions that existed in blossoming time, is that correct? A. It was.

Q. As secretary there of that particular local, how was the crop, generally, in your neighborhood?

A. Well, it was very light in the whole district.

Q. Very light in the whole district. Can you give us any idea of what percentage of the normal crop was had in that district?

A. I haven't any exact figures, but my estimate would be about a tenth of the crop.

Q. And that was fairly constant throughout that district, is that correct? A. Yes, sir.

Mr. Moore: That is all.

#### Cross-Examination

Mr. Naus: Q. In other words, over in that district where you were the rainfall was sufficiently heavy during blossoming time for the rain to carry away blossoms, pollen, and the like, and prevent the fruit from setting? A. Yes, sir. [314]

Q. And that was the simple cause of the shortness of your crop, wasn't it?

A. In my opinion, yes, sir.

Q. In districts away from your orchard, if the rainfall had not been sufficient to take the same amount of blossoms and pollen off the trees at

(Testimony of William D. Eiper.)

blossom time, the effect would have been different in the setting of the fruit, wouldn't it?

A. Would you repeat the question?

(Question read.)

A. Well, sometimes two or three days of rain is all that is necessary to lose your whole crop of fruit. It is not the quantity of the rain. It is the time when it strikes your orchard.

Q. I will put it this way, then: If in some district—I am not speaking now of your district, but other districts in the counties of the State of California—if in any particular district where apricots were being raised, if the rain was not heavy enough to take off most of the blossoms and pollen, but the rain left a substantial amount of blossoms and pollen on the trees, then more fruit would set, wouldn't it?

A. Yes.

Q. So it gets down to the matter in your opinion as to the extent of the blossoms and pollen left on the trees after any period of rain?

A. Yes, sir.

Q. You say you are about 12 miles from the Natividad plant at Permanente?

A. Yes, that is what I would judge.

Q. Any hills between you and the plant?

A. Well, low hills, [315] yes, but no high range of hills.

Q. You are in a different region than the region in which the Permanente plant is, aren't you?

A. Yes.

(Testimony of William D. Eiper.)

Q. I mean a different region for purposes of apricot growing; you are in a different region entirely?      A. Yes, sir.

Mr. Naus: That is all.

The Court: You may step down.

Mr. Moore: May we have the recess now, your Honor, and I would ask, with Mr. Naus' approval, that these two witnesses be excused.

Mr. Naus: I have no objection.

The Court: Very well, we will take the recess.

(Recess.)

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J. M. GAROUTTE,

called as a witness by defendant; sworn

The Clerk: Q. What is your name?

A. J. M. Garoutte.

Direct Examination

Mr. Moore: Q. What is your business, Mr. Garoutte?

A. I am superintendent of the Natividad and Moss Landing plants of Permanente.

Q. Are you an engineer by education?

A. No, I am a chemist by education.

Q. You graduated in chemistry, did you?

A. I did not graduate, no. Three years.

Q. Where did you go to college?

A. University of California. [316]

Q. You studied chemistry there, did you?

A. Yes, sir.

(Testimony of J. M. Garoutte.)

Q. You are superintendent in charge of the Natividad plant and the Moss Landing Plant, is that correct? A. Yes, sir.

Q. And the activities in those two plants are conducted under your supervision, is that true?

A. Yes, sir.

Q. You are familiar with the so-called Cottrell separator there relative to dust catching?

A. Yes, sir.

Q. Can you tell his Honor when that was installed and when it first started to operate?

A. It first started operation in August, 1943.

Q. August, 1943? A. Yes, sir.

Q. Prior to that time was there any time of dust catching there?

A. Well, a lot of dust accumulates in the so-called dust box and the duct work and the stack on each kiln.

Q. Before the installation of this Cottrell apparatus will you explain to his Honor the dust situation there, and the amount of it that escaped, as nearly as you can tell us, if you have no records or figures of any kind; if you haven't, give us a general idea of the dust situation up to August, 1943.

A. The only method we had of determining the amount of dust—actually, we could not say how much dust went out the stack. Provision was made in the construction to collect the dust that accumulated in the smoke boxes, so-called, and the stack

(Testimony of J. M. Garoutte.)

installation, which dust was picked up and elevated back into the feed bins, and by balancing the amount of material fed to the [317] kiln and the amount of material produced, we will say, in each kiln, that would be the only estimate we could have of the amount of dust that was emanating from a stack.

Q. Have you ever made any such estimate or have you any idea on that subject?

A. That varies with the tonnage produced. The maximum tonnage before the installation, as I recall, was around 160 to 170 tons per kiln, and roughly, in the calcine form, that is, in the finished product form, the amount of dust was approximately 10 percent. Now, that again—well, that is enough, I guess.

Q. I didn't hear you.

A. I think that is not—it is as accurate an index as we could get under the conditions.

Q. You mean there was that amount—

A. About 10 percent—I would say 16 tons a day was the loss on the basis of the finished product form, that is, on the basis of the calcine.

The Court: Q. On each kiln?

A. Yes, sir.

Mr. Moore: Q. After the installation of this Cottrell system have you any estimate of the amount of dust there that escaped?

A. After the installation?

Q. Yes.

(Testimony of J. M. Garoutte.)

A. We made a number of tests on the basis of single kiln tests. The dust amounted to, I would say, a maximum of about 5 tons per kiln, and an average of probably 1½ to 2 tons per kiln, perhaps maybe it was three. I can't recall.

Mr. Naus: His voice falls and I can't follow everything he says. [318]

The Witness: I will talk louder.

Mr. Naus: May I have the last answer read?

(Answer read.)

Mr. Moore: Q. I do not understand your answer. You said 5—

A. I said a maximum of 5 tons, that is, figuring on the basis of efficiency, I would say the average efficiency was something better than 90 percent.

Q. In other words, the amount of dust that was collected, if we may say that—

A. Is 90 percent of the total amount of dust offered to the installation.

Q. Have you records with you relative to the operation of these kilns during the months of February, March and April of 1943?

A. February and March, 1943.

Q. February and March?

A. Yes, I have here—

Q. Pardon me, may I have it?

A. —the kiln reports, on which I have placed on the cover the days the kilns were down.

Mr. Naus: Mr. Moore, I couldn't possibly take up his Honor's time looking over a batch of stuff like that. I have never seen it before.

(Testimony of J. M. Garoutte.)

Mr. Moore: Q. You have produced here, Mr. Garoutte, various documents. Will you tell us what those are?

A. These documents are the kiln reports that are turned in. They are pieces of paper turned in by the burner, one on each shift, on the kiln installation, which shows the readings on the feed to the kiln, which in turn gives him the tons produced and the amount of gas [319] per kiln and information of that kind, and they also show whether or not the kiln was operating on any given day.

Q. Are those turned in daily?

A. Yes, sir.

Q. And you have here the records for February and March, 1943, is that correct?

A. And 1944.

Q. And 1944? A. Yes, sir.

Q. Directing your attention to 1943, I asked you to make a summation of the operation of those kilns in the months of February and March, 1943. Have you made such an examination?

A. Yes, sir, on these covers.

Q. You made those on the covers of these reports? A. Yes, sir.

Q. And that summation properly represents the reports that you have in your hand, is that correct?

A. Yes, sir.

Q. Will you tell us the operation of those kilns in the month of February, 1943?

(Testimony of J. M. Garoutte.)

A. Those kilns were operating for all days except No. 2 kiln. One of the kilns was down from the 25th to the 28th of February, inclusive.

Q. Outside of that, both kilns were operating—

A. Outside of that both kilns were operating daily.

Q. Were they operated on an 8-hour basis or on what basis? A. A 24-hour basis.

Q. On a 24-hour basis? A. Yes, sir.

Q. How about the month of March, 1943?

A. March, 1943, the No. 2 kiln was down March 1st to March 4th, inclusive.

Q. Aside from that—

A. Aside from that they operated on a 24-hour basis. [320]

Q. Now, in 1944, the month of February 1944, have you the record there?

A. Yes, sir. Both kilns operated on a 24-hour basis the whole month of February 1944.

Q. How about the month of March 1944?

A. The month of March 1944—March 1 to 4 inclusive, one kiln was down; March 15 to 16 inclusive, one kiln was down, and March 18 to 24 inclusive, one kiln was down.

Q. Aside from those particular periods that you have referred to, the kilns were operated on a 24-hour basis, is that correct?

A. Yes, sir, that is right.

Q. Now, this Cottrell installation—there were various changes or improvements, if we may term

(Testimony of J. M. Garoutte.)

it that, in that installation after it was initially installed, were there not?

A. Yes, sir, there were many changes required.

Q. In the previous testimony—you weren't here—there was some testimony relative to the change-over from natural gas to oil or vice versa in the operation of that plant at Natividad. Was there such a change made?

A. We were required to burn oil for practically all of the months of December, January, and February—December of 1943 and January and February of 1944 generally. For a time we were required to burn oil at night and were allowed to burn gas in the daytime.

Q. You say you were "allowed." By whom do you mean?

A. By the War Production Board limiting us.

Q. In the operation of that Cottrell system did the change-over [321] from oil to gas or gas to oil have any effect on its operation?

A. No, sir, generally not, except we had some trouble, but not—mechanical trouble rather than, I would say, trouble that affected the efficiency of the operation.

Q. Will you explain to his Honor just what that trouble was and what was done in an effort to cure it.

A. Well, the Cottrell was originally constructed—the curtain walls are brick. The walls are about 20 feet high and probably 40 feet wide and 40 feet

(Testimony of J. M. Garoutte.)

long. They are attached to concrete columns at four different intervals in the length of this wall, and this attachment is to allow expansion and contraction when you are either heating it up or shutting it down. And your curtain walls were not constructed as the duct, and when we went to oil, when we burned oil, the vibration in the burning was such that it caused a fluttering in the curtain walls of this Cottrell and had a tendency to crack them. Such vibration is from the actual burning of the burner at the far end of the kiln, some 400 feet away, but each one of those pulsations caused a vibration in the duct work, which in turn was transmitted into the Cottrell, and because the curtain walls were not constructed as ducts, it was necessary to reinforce them—that is, they actually failed; and I would say the movement was as much as a quarter of an inch, and cracked some of this brick work, which we had to strengthen.

Q. And what did you do in curing that condition?

A. Well, [322] steel framework was designed which broke up the panel, we will say, of this curtain wall. It was about 10 feet and about 20 feet high, and built up laterally into three panels, which was tied to steel, and from the steel was tied to the concrete columns, which took the period, we will say, out of the vibration of this brick wall.

(Testimony of J. M. Garoutte.)

Q. In the operation of that Cottrell system have you had other problems you have had to meet?

A. Yes, sir.

Q. Will you explain what they were.

A. Well, when we—the original installation called for brass castings that held the electrodes. After the things were installed, the brass failed. It was a design error, and we had to shut down and get new castings, heat-resistant castings, and rebuild portions of the structure of the Cottrell.

The Court: Q. Did you burn the brass out?

A. The brass distorted; it didn't burn out; but under the heat it would crystallize in some way and crack and drop our whole rod curtains down three of four times.

Then there was a matter of operating temperatures. The temperature at which the Cottrell operates most efficiently is from 750 to 800° F., and that required some considerable work to find the most efficient operating temperature. That is, as we go higher, structurally the equipment is liable for failure because of the high heat. If you go lower, the efficiency drops off. But by closing up and very definitely trying [323] to eliminate all leaks in it, we were able to maintain the temperature at a minimum of 750° in the Cottrell with a safety mechanism which opened the Cottrell to cold air if the temperature went above 820°.

Mr. Moore: Q. Now, the operation of that Cottrell has been under your direct supervision, has it, Mr. Garoutte? A. Yes, sir.

(Testimony of J. M. Garoutte.)

Q. As these problems arose in connection with it, did you consult with other people?

A. Yes.

Q. And with whom did you consult in that connection?

A. Well, primarily Western Precipitation, who designed the thing.

Q. And do you know Dr. Duschak? Did you consult with him? A. Yes, Dr. Duschak.

Q. In the operation of that Cottrell system have you ever made a request of the company that you are employed by for materials or money or anything of that sort to make changes or experiments there that has ever been denied you? A. No.

Q. In other word, would it be your statement that from the times that Cottrell system was installed up to the present time that every effort has been made by the Permanente people to make that system function properly?

A. That is right.

Q. In your opinion, is it functioning properly now? A. Yes, sir, I believe it is.

Q. It has been a matter of some experimentation and changes? [324]

A. Yes, sir, that is right.

Mr. Moore: That is all. I would like to ask one question:

Q. In your opinion, is it functioning efficiently today, Mr. Garoutte?

A. Yes, sir, I believe it is.

(Testimony of J. M. Garoutte.)

Cross-Examination

Mr. Naus: Q. Mr. Garoutte, do you mean to say that the period of experimentation with that Cottrell has ended and you have now reached the final stage that you intend or expect to reach with it?

A. As far as operation of that unit, I would say yes. That is, we are doing everything we can to keep it operating at maximum efficiency at all times.

Q. You confined that to operation as distinguished from design? A. Yes, sir.

Q. You mean you are through with your experimentations merely as to operating efficiency under the present design, is that it?

A. No, I wouldn't say that. The problems that have arisen in the operation of the Cottrell are not a matter of experiment; they are a matter of the most efficient operating procedure. It isn't a matter of going off on some experiment as such; that is, we are not trying anything more than to collect all the dust that is offered to the Cottrell.

Q. Do you mean to suggest that there is nothing further that can be done to diminish the amount of dust still coming out of the top of the stack?

A. There is a possibility that a [325] certain amount of that could be diminished. That is—

Q. I thought you had finished. Did you want to say something further?

A. No, I will let it go at that.

(Testimony of J. M. Garoutte.)

Q. These recent tests as to the amount of dust coming out of the top of the stack were in the present month, weren't they, the early part of the present month of September? A. Yes, sir.

The Court: I didn't get that. Read it.

(Question and answer read.)

Mr. Naus: Q. That was an attempt at scientific measurement of the amount of dust as best it could be done, wasn't it? A. Yes, sir.

Q. On any prior occasions was there ever any attempt from a scientific basis to measure the amount of dust coming from the top of the stack?

A. Well, we made our own measurements, but I don't know how scientific they would be.

Q. Of dust coming from the top of the stack?

A. That measurement of the dust is a matter that is ordinary procedure, and you do it to the best of your ability all the time.

Q. I am speaking of the measurement of dust coming out of the top of the stack.

A. Yes, sir.

Q. Is that what you are speaking of? Now, at the present moment as you are sitting on the stand, you would say there are about four tons a day coming out of the two stacks, wouldn't you—a day of 24 hours, four tons of dust?

A. Yes, sir, I would [326] say that was four tons—four, perhaps even five.

Q. Perhaps even five tons. Why do you say that?

(Testimony of J. M. Garoutte.)

A. Well, because every count we have ever made there has never been two that are exactly the same.

Q. Then state in your own way your estimate or impression or understanding of the amount of dust coming at this moment in a 24-hour period out of the top of those two stacks.

A. Yes, sir.

Q. What is it?

A. I would say a maximum of six tons a day.

Q. And what would you say the minimum?

A. A minimum of about three.

Q. Right at the present time it is running in a range of three to six tons of dust out of the top of the two stacks when you are in 24-hour operation?

A. No, sir; that is under a maximum load in the kiln.

Q. All right. Now, what do you call a maximum load in the kiln in a 24-hour period?

A. 190 to 200 tons per day per kiln of finished product.

Q. Is it running under that maximum loading now? A. No, sir.

Q. Has it run under that maximum loading in the past? A. Yes, sir.

Q. Over what period of dates or range of time?

A. Well, since June of this year I would say that it has run at about 70 to 75 percent of maximum capacity. That is an estimate.

(Testimony of J. M. Garoutte.)

Q. You call that maximum loading of the kiln—is that your [327] phrase? A. Yes, sir.

Q. What was your loading of the kilns in the month of February 1943 on an average through that month?

A. Oh, on an average I would say at that time it was at maximum capacity, but at the present time it is—

Q. I am only asking about that time.

A. Well, it varies. The tonnage on maximum loading now is greater than it was at that time.

Q. My question is simply addressed to February 1943. I want to find what was the amount of loading of the kilns in the month of February 1943.

A. About 160 tons per day per kiln.

Q. And what was the amount of loading of those kilns in the month of March, through the month of March 1943?

A. I would say approximately the same.

Q. What was it in the month of February 1944?

A. It was about 180 to 190, I would say, on an average.

Q. And what was it in the month of March 1944? A. About the same.

Q. Now, these various tonnages you have given—does that cover the two kilns, or just one?

A. No, 160 tons per day per kiln. That is three hundred and—

Q. In the months of February and March 1943 you have already given us the days on which the kilns were operated. A. Yes, sir.

(Testimony of J. M. Garoutte.)

Q. The same as to February and March——

A. Excuse me; the days that I gave you were the days that the kilns did not [328] operate. That is, the kilns operated other than those days.

Q. You gave it both ways. You said it operated 24 hours during all of those months excepting those days, so that gave both figures?

A. Yes, sir.

Q. That included Sundays and holidays, did it?

A. Yes, sir.

Mr. Naus: May we have this batch of documents marked for identification, if the Court please?

The Court: They may be marked for the purpose of identification.

(The folders referred to were marked Plaintiffs' Exhibits 13, 14, 15 and 16 for Identification.)

Mr. Naus: Q. Is there anything you know of in the way of designing that could result in decreasing the amount of stack loss as it is now running?

A. Well, I don't know that I am qualified to answer that. That is, I—it is possibly so, but I am——

Q. If your answer is you don't know, I will pass on. A. That is right.

Q. Is that your answer? A. That is right.

Q. Now, when did those kilns first go into operation down there?

A. The 4th of August 1942.

(Testimony of J. M. Garoutte.)

Mr. Moore: I think there is an error there.

Mr. Naus: Pardon me. Counsel for Permanente suggests that your answer may be in error. Have you a recollection of the date?

A. I have a recollection, yes. That is, it wasn't [329] operating at full capacity on that date. That is, one kiln was operated for about thirty days only, that is, while the construction was completed on the rest of the plant.

Q. Could we put it this way: Is it or not the fact that prior to August 1942 neither kiln had ever operated? A. Yes, sir.

Q. It is perfectly clear, is it not, that in the month of February 1942 neither kiln was operating—correct? A. Correct.

Q. And that in the month of February 1942 no dust was coming out of either stack?

A. That is right.

Q. And at no time prior to August 1942 was any dust coming out of either stack; that it correct, isn't it? A. That is right.

Q. Could you speak up so the reporter and I could hear you? A. Yes.

Q. Was the Cottrell precipitator a part of the original plan or design of the operation, or did that come subsequently?

A. The Cottrell was originally—I don't know that you would call it a part of the design; that is, no—on the original drawings which were made, they were merely layout drawings; that is, actual flow drawings rather than design drawings, and

(Testimony of J. M. Garoutte.)

I don't think the Cottrell in the original drawings ever reached the design stage.

Q. Was the original design of the stacks for a height of 200 feet?

A. I don't think they are that high. That is—

Q. What is their height?

A. As I recall, it is about 120 to [330] 130 feet—somewhere around that.

Q. Were they originally designed to the present height that exists—were they originally designed to that height before the decision to install the Cottrell precipitators? A. Yes.

Mr. Naus: I think that is all.

#### Redirect Examination

Mr. Moore: Q. Just one or two questions. You gave certain figures to Mr. Naus relative to tonnage. Were you referring in those figures to the finished product or the raw material?

A. Finished product.

Q. In other words, all the testimony that you have given relative to the production of those kilns has to do with the tonnage of finished product rather than of the raw material?

A. That's right.

Q. These tests that were taken here in this month, in September, were they taken under your supervision? A. No, sir.

Q. In other words, you had nothing to do with the taking of those particular tests?

(Testimony of J. M. Garoutte.)

A. No, sir, other than to make all facilities available to them.

Q. So any testimony that you have given here is merely what you have, you might say, heard around the plant, is that correct?

A. I have never seen the results of the tests actually made at that time.

Q. They were made under Dr. Duschak's supervision, were they? A. Yes. [331]

Q. And who was the man that made them?

A. Mr. Brundage, I believe.

Q. Who is he?

A. He is a testing engineer of the Western Precipitation Company.

Q. And those tests were not carried out as part of your job there? A. No, sir.

Mr. Moore: I think that is all.

Mr. Naus: Q. You speak of the weight of tonnage of finished product. What is the relationship in weight between—

Mr. Moore: Pardon me. May I interrupt you? There is one question I would like to ask that I overlooked.

Q. Mr. Garoutte, in this dust problem down there, you are familiar with the quarry operations, are you not? A. Yes, sir.

Q. That is where the raw dolomite is mined?

A. Yes, sir.

Q. And in your opinion, any dust that is spread over the neighborhood there, does any portion of that come from the quarry operations?

(Testimony of J. M. Garoutte.)

A. I would say no appreciable amount, no. That is, the only dusty operation, practically, is the blasting operation.

Q. And any dust that is distributed over that immediate vicinity, it would be your opinion that it came from these stacks? A. Yes, sir.

Q. From the kilns? A. Yes, sir.

Mr. Moore: That is all. [332]

#### Recross Examination

Mr. Naus: Q. You have seen dust from the kilns, from the stack, on the Pista orchard itself, haven't you? A. Yes, sir.

Q. You have been in the orchard and seen limbs shaken and seen the dust fall to some extent?

A. Yes.

Q. Pretty heavy dust, was there, in 1943?

A. I would say it was appreciable.

Q. Pretty heavy, was it?

A. Well, I don't know. I would say—I have never seen it anyplace else; I don't know. I would say it looked like an appreciable amount of dust, there is no question about that.

Q. You have never seen dust anywhere but in the Pista orchard?

A. No, I have never had any experience with a dust problem at other points.

Q. Now, you speak of the weight or the tonnage of the finished product in answer to Mr. Moore. What is the relationship between the weight of the finished product and the weight of the original raw dolomite?

(Testimony of J. M. Garoutte.)

A. Well, theoretically, on a basis of complete ignition, why, the feed is 1.834 times the product.

Q. 1.834 times? A. Yes.

Q. By the way, there was a question I should have asked a while ago. In the months of February and March 1943, which as we all know now is before the Cottrell was installed and [333] functioning, what is your estimate of the total weight of dust escaping from the top of the two stacks when both kilns were operating—weight per 24 hours?

A. Oh, I would say that it—that the dust offered—well, let me see now. I would say possibly 30 tons a day in the two stacks.

Q. 15 tons each?

A. 15, 16 or 17 tons a day per stack.

Q. And how do you arrive at that estimate? What is your method of measurement or calculation or estimate?

A. That calculation is based on the difference between the tons fed and the tons produced, again going back to this theoretical factor which we mentioned a moment ago of 1.834.

Q. Are the tons fed weighed into the kiln?

A. Yes, sir.

Q. And the output weighed out?

A. No, it isn't weighed out except as it is shipped.

Q. Is there any loss in weight after the completion of the operation before trucking, before weighing?

(Testimony of J. M. Garoutte.)

A. Well, there is a tendency to pick up weight.

Q. A tendency to change the weight then?

A. Yes, sir.

Q. Then this all depends on an estimate you have made by comparing the raw dolomite in and the finished product out? A. Yes.

Q. What do you call that finished product out, by the way? A. Calcined dolomite.

Q. And on the assumed or theoretical basis of 1.834 times— A. Yes, sir.

Q. (continuing)—the weight of the finished product as [334] representing the weight of the raw dolomite? A. Yes.

Q. How is that 1.834 determined as a theoretical factor?

A. It is determined by a matter of taking the stone and completely igniting it and getting the percentage of ignition.

Q. In other words, then, taking the raw dolomite fed in, the weight— A. Yes.

Q. Applying that factor of 1.834?

A. Yes, sir.

Q. Taking the weight of the finished product, why, there was some tonnage loss somewhere and you assumed it went out the stack?

A. Yes, sir.

Q. That is the way you estimated it?

A. That is right.

Q. Now, in this recent testing, that was the actual weight of the dust itself in the stack, wasn't it, or do you know?

(Testimony of J. M. Garoutte.)

A. You are speaking of the tests early this month?

Q. Yes.

A. I don't know where or how they were taken.

Mr. Naus: Thank you. That is all.

#### Further Redirect Examination

Mr. Moore: Q. Mr. Garoutte, if I understood you, the estimate of 15 to 16 tons per day per stack was before the Cottrell was put in, is that correct?

A. Yes, sir; that is on a basis of the finished product again.

Q. Now, was there an effort made to collect dust even before the installation of the Cottrell?

A. Well, we collected the dust that was—that settled in any open area of dust. Every time you change the velocity of the gas you drop dust in any [335] part of the system, and provision was made with screw conveyors and elevators to bring that dust out of the system; that is, to keep it out of the equipment.

Q. The screw conveyors and that process was used from the beginning?

A. Yes, sir, that was put in originally.

Q. I didn't get it clearly. You said that the Cottrell was not in the flow sheets, as you call them.

A. No.

Q. Or design. Just where did the Cottrell come into the picture?

A. Well, I said that the Cottrell was probably in the flow but never reached the design stage, the

(Testimony of J. M. Garoutte.)

Cottrell itself. That is, it was just a square mark on a flow drawing marking the Cottrell.

Q. On a flow drawing there was a place for the Cottrell, is that correct?

A. Well, a flow drawing is very indefinite. It is a matter—it is a piece of paper that when you start to construct a plant you get the products in and the products out and the gas flow, and everything else; it is just a square, a mark on a piece of paper. But to reach the design stage, why, it has to go into complete structural drawings.

Q. Into detailed drawings

A. That is right.

Q. In the original plan there was a portion of those plans labeled for the Cottrell, is that right?

A. Yes, sir, that is right.

Q. But the detailed manufacture or setup of that particular installation was not completed or done at that time? [336]

A. That is right.

Q. That was done subsequently?

A. Yes, sir.

Q. Now, this plant went into operation, you said, in August 1942? A. Yes, sir.

Q. And when was the Cottrell installed there?

A. Well, the Cottrell was ordered and design started either in December or January of 1943, and the construction was completed in, I would say, August of 1943.

Q. You said December or January—

(Testimony of J. M. Garoutte.)

A. December of 1942 or January of 1943.

Q. In other words, the plant started operating in August 1942, is that correct? A. Yes, sir.

Q. And the design of the Cottrell was made in December 1942 or January 1943?

A. The design was started at that time; that is, it was something of a procedure. Drawings were started, and the engineering work was started, and the Cottrell was actually ordered—the requisition or purchase order was issued to the Western Precipitation Company at about that time—either December of 1942 or January of 1943.

Q. And when did they actually start installing the Cottrell there?

A. Well, the work that we did on it, which was all the work below grade—that is, our company did—was started in March, if I recall correctly—in the early spring.

Q. Of 1943? A. Yes, sir.

Q. Do you know of your own knowledge the cost of that installation? [337]

A. No, not the complete cost.

Q. That is, the installation was made by the Western Precipitating Company, is that correct?

A. Western Precipitation Corporation.

Q. It wasn't made under your supervision?

A. No, our part of the structure was the part of the structure that was below grade, the footings. We brought the footings to grade and turned it over to them, and they completed the installation.

Mr. Moore: I think that is all.

(Testimony of J. M. Garoutte.)

Further Recross Examination

Mr. Naus: Q. By the way, I think you gave the height of the stack as 120 to 130 feet, did you?

A. Yes; that is an estimate. I don't know the exact—I would say that it is less than 150 and certainly more than 110 or 115. It is in that general—I could find out.

Q. What is—pardon me?

A. I could look it up, but I don't have it at hand.

Q. What is the lowest point below the top of the stack at which dust first enters into the stack?

A. Well, the center line on the duct—the original duct—was probably seven feet from the bottom; we will say the bottom being grade of that stack—that is, not the bottom of the footing, but the grade—the actual grade of the surrounding area.

Q. Well, then, assuming the stack to have been 120 feet high, as you estimate it, the dust would have a travel, then, of [338] seven feet less, or 113 feet from the point of entry to the top of the stack, is that it? A. Yes.

Q. I just wanted to see your thought to see if I had it right.

A. That is generally so, but I am not certain about the actual height of the stack.

Q. Have you some information somewhere from which it could be determined?

A. Well, I could get it later, but I can't get

(Testimony of J. M. Garoutte.)

it right now; that is, it is at the plant. I can look at the drawings and find out how high it is.

Q. Is it available anywhere in San Francisco?

A. No, sir.

Q. Could you send that information in to Mr. Moore so it would be available to me this coming week when the trial resumes? A. Yes, sir.

Mr. Naus: Thank you.

The Court: Is that all?

Mr. Naus: That is all.

Mr. Moore: Let's understand exactly what you want, Mr. Naus.

The Court: Is that all you want?

Mr. Naus: Yes.

The Court: Of this witness?

Mr. Moore: That is all, yes.

Mr. Naus: Yes.

The Court: May I make some inquiry of my own off the record? [339]

(Inquiry by the Court off the record.)

Mr. Moore: May the witness be excused, Mr. Naus?

Mr. Naus: Yes, subject, of course, to sending in that information to you that can be available to me when you receive it.

The Witness: The height of the stack.

(Thereupon a recess was taken until 2:00 p.m. this date.) [339a]

Afternoon Session, September 15, 1944  
2:00 P. M.

Mr. Moore: Dr. Duschak, will you resume the stand?

Mr. Naus: Do you want to resume with him now?

Mr. Moore: Yes.

L. H. DUSCHAK,  
recalled;

Cross-Examination (Resumed)

Mr. Naus: Q. Doctor, did you finish your homework on figuring? A. Yes, sir.

Q. What did you come up with?

A. Astronomy.

Q. Will you give us the astronomical figure? I thought we would reach there sooner or later.

A. Your question, I believe, was as to the number of particles of certain specified sizes in one pound of dolomite.

Q. I hesitate to repeat the question, because if I repeat it differently we might have to figure all over again. Suppose we start with the results you reached and we will go back from that point.

A. That was my understanding of the problem.

Q. All right.

A. One pound of dolomite in the form of cubes, 46 microns on an edge, will contain 1,664,300,000 particles, approximately.

Mr. Moore: Could I have that again?

The Witness: 1,664,300,000.

(Testimony of L. H. Duschak.)

The Court: Q. Didn't he give you two other problems?

A. Yes. The next question was to calculate the number of par- [340] tiles if they be 10 microns in diameter, which I have taken to mean in the form of cubes, 10 microns on the edge.

Q. Go ahead.

A. In that case we will have 161,836,390,000 particles.

Q. In a pound?

A. In one pound of dolomite, and if we go down to little cubes, five microns on an edge, one pound of dolomite will contain 1,295,500,000,000 particles, approximately. I say approximately because I haven't carried out the digits.

Q. As I understand it, then, you have done that figuring on the calculation or on the assumption that the particles were cubes?

A. Only at your request, sir.

Q. I did not suggest anything as to the shape of the particle.

A. Oh, I beg your pardon. Yes, I assumed that the particles were in the form of little cubes, that is right.

Q. If the particles were spheroid instead of cubical, it would nearly double the number of particles in a pound, wouldn't it? Wouldn't it increase the number by about 50 percent? A. No.

Q. What is it?

A. Your volume of a cube is the cube of the diameter and the volume of the sphere is  $4/3$  of the

(Testimony of L. H. Duschak.)

cube. It would increase the number by something less than 50 percent. I do not recall the figure off-hand.

Q. Spheres do not rest exactly on top of each other when compacted together, but fill the interstices between the spheres? A. Yes.

Q. Somewhere around 50 percent higher if you assume the circle [341] shape instead of the cubical shape, isn't that so?

A. No, my recollection is it would not be higher than 25 percent.

Q. We will settle for 25 percent then. That is in the carbonated form of the dolomite, isn't it?

A. My calculation is for dolomite, yes.

Q. By the way, there was something said by Mr. Garoutte this morning about the end product of the operation at Natividad being, what was it, calcium dolomite? A. Yes.

Q. That end product comes out, as I understood you the other day, in pieces up to one or two inches in diameter or size?

A. No, I think I said up to about a half inch.

Q. Up to about a half inch in size?

A. Yes.

Q. Or a very small particle up to a maximum size of a half inch in diameter: Does that cover it?

A. That is an approximate description.

Q. And all sizes in between, perhaps?

A. That is correct.

Q. What is done with that end product when the process is finished? Is it put in a stock pile?

(Testimony of L. H. Duschak.)

A. No, it goes into a closed storage bin.

Q. Is that closed storage bin moisture proof?

A. Reasonably so, yes. It is a tight steel bin with a tight cover. It is not absolutely hermetically sealed but the contents are very well protected from the atmosphere.

Q. Does any atmospheric air enter this chamber that the end product is put in?

A. Yes, it will enter it when material is [342] drawn out, and it could be expelled from it when material is charged into it.

Q. Is that a frequent occurrence?

A. Yes. The transfer of the freshly calcined material to this storage bin is continuous. The withdrawal is whenever a truck is to be loaded.

Q. Anyway, when it comes out of this chamber it is loaded onto an automobile truck, is it?

A. That is correct.

Q. And is it loaded by power shovel?

A. No, spouted.

Q. Spouted—it flows out of a spout into a truck?

A. That is correct.

Q. Into an open truck?

A. Yes, in some cases.

Q. What happens in other cases?

A. In some cases the truck is covered or partially covered.

Q. Covered how?

A. I can't answer that in detail, Mr. Naus. I really have not observed those operations carefully.

Q. In some cases, as I understand, it is loaded

(Testimony of L. H. Duschak.)

into an open truck by pouring through a spout into the chamber, and in other cases it is loaded into a truck and covered in some way?

A. I have seen trucks covered with tarpaulin and I have seen down there some trucks that are very much like oil tanks, that is, they are completely enclosed. Just which of those they use when I couldn't say.

Q. These trucks that are loaded in the open and left uncovered and those that are loaded in the open and then covered with a textile, what then becomes of those trucks?

A. They are immediately weighed and sent to their destination.

Q. How far away?      A. Their destination?

Q. Yes.

A. Well, it might be to Moss Landing. At one time it might have been Manteca. Possibly some other places.

Q. When those go over to Moss Landing, do they travel through the atmospheric air for about eighteen miles?

A. The truck travels through the atmosphere, yes.

Q. Yes, I know, but I am thinking of the contents of the truck that are loaded in the open truck; the contents, the calcined dolomite, travels through the open air, the atmospheric air?

A. It travels with the truck, yes.

The Court: What is the purpose of this testimony?

(Testimony of L. H. Duschak.)

Mr. Naus: The purpose, if the Court please, is this: To test the statement of the witness on direct that the particles, instead of going out immediately to the chamber and then to the trucks, as the end product, that go up the stack and are called stack loss and then travel from a half mile to a mile to reach the Pista orchard, this witness has testified on direct that in his opinion Mr. Twining is wrong in saying they could land as an oxide. This witness says they must necessarily have landed as a carbonate, both the calcium and the magnesium having been returned to their original form and landing as a carbonate, they wouldn't be caustic. I want to show what weight should be given to that, because this bears on the causticity, for if the identical particle, instead of traveling [344] from a half mile to a mile from the top of the stack over to the Pista orchard, returns to the original form that it came out of the quarry, why, then, we are dealing with perfect stupidity in calcining at all, because in taking it 18 miles to Moss Landing through the open air it should necessarily, it seems to me, return to carbonate, and what is accomplished by the whole process? That is the purpose—to test on cross-examination what he said on direct, that those particles that come out of the stack, instead of being loaded into the truck travel in the air, and in the course of that travel through the atmosphere of a half mile to a mile, returned to the original form of carbonate and ceased their oxide form.

(Testimony of L. H. Duschak.)

The Court: What I have in mind is this: I want to follow the testimony. We are going into minute details on this phase that may be an important phase of it, but I am trying to keep in mind that I have a calendar next week.

Mr. Naus: But the difficulty is, if your Honor please, your Honor realizes—I know you do through all your years of experience—when an expert takes the stand and on direct gives an expert opinion on a scientific question, there is no way to test the validity or value of that opinion except through an approach of this kind. I couldn't ask him whether since he testified on direct he has changed his mind. I have to seek to reason with him.

The Court: I just wanted to give you that admonition. [345]

Mr. Naus: I will do the best I can, if the court please. May I have the last question?

The Witness: I think I could dispose of that—

The Court: We will get into difficulty now. Never volunteer anything.

Mr. Naus: I got a lot yesterday that way that I would never have gotten otherwise. Will you read the question, Mr. Reporter?

(The last question and answer read.)

The Witness: May I qualify that answer by suggesting that the truck body is tight and it is only the surface layers of the material in the truck that are exposed to the atmosphere.

Mr. Naus: I will be glad to accept the qualification.

(Testimony of L. H. Duschak.)

Q. Now, at least some of that crushed and calcined dolomite that travels 18 miles through the atmosphere—will some of that return to carbonate in the course of the trip?

A. Yes, a small amount. Mr. Garoutte testified this morning as to the pick-up in weight, I think he called it.

Q. Mr. Garoutte testified to the pick-up in weight— A. Of the calcined material.

Q. Only at the end of the calcining process. He did not touch upon the question of the movement of that end product after the calcining process.

A. This movement takes place after the calcining process.

Q. That is why I say he did not testify to it. Now, to what [346] depth in that truckload will that calcined dolomite return to its original form? That is to say, the calcium and the magnesium, its original form of carbonate?

A. I have no way of answering that question. I have not made any tests on that point.

Q. What is the depth of that truck load as it moves away from Natividad?

A. The trucks, I would say, are filled to a depth of three feet or four feet.

Q. Yes, three or four feet. What is the cubical contents or tonnage weight of a truckload of it as loaded there?

A. I realy do not know. I think about 10 tons, but I may be high or low on that. I do not know the capacity of their trucks.

(Testimony of L. H. Duschak.)

Q. Then is this a fair statement of the situation, that starting out with a truckload of that calcined dolomite, after it has gone through the calcining plant, that in the course of travel of 18 miles through the atmosphere, these open truckloads, that it will arrive at Moss Landing with some of it returned to carbonates and some of it still oxides, and some of it perhaps hydroxides?

A. Yes, that is a correct statement. We should add that there will only be a small amount which will have reverted to carbonate or have been converted to hydroxide.

Q. You mean just a thin coating at the top of the load?

A. Well, I mean a thin coating on the particles which have had some exposure to the atmosphere, yes.

Q. Now, as a professor of chemistry, and from all the knowledge [347] and thought that you can give to the subject at the moment and all the background that you have had, how deep down would you have to go from the top of that truckload, penetrating it perpendicularly, to encounter calcium oxide?

A. I am not sure that I understand what you mean by encountering calcium oxide?

Q. I will put it a little differently. As I understand you so far, here we will have a truckload of something that up in the quarry started out mainly as calcium carbonate and magnesium carbonate, am I correct?

A. That is correct.

(Testimony of L. H. Duschak.)

Q. And after going through this calcining process we have an end product that originally comes out as calcium oxide and magnesium oxide, isn't that so? A. That is correct.

Q. And at sometime after exposure to the atmospheric air some of that in turn will become calcium hydroxide and magnesium hydroxide, do you follow? A. Yes.

Q. All right. Now, you say that after exposure of a particle, at least, of what was originally an oxide, exposure to the atmosphere, it rapidly returns to its original carbonate form; I think you said that yesterday.

A. I said that with reference to these small particles, yes.

Q. And you are saying it today, also, are you not, with respect to a thin layer on top of a truck-load when it is exposed to 18 miles of travel through the atmospheric air? A. Yes.

Q. Going through that thin layer on top, at the end of that 18 miles of travel, how deep down would you have to dig into it to [348] penetrate through all that is carbonated to reach the top of what is still oxide?

A. I have no way of answering that question.

Q. As an expert on the subject, would you give me your best estimate or opinion?

A. Well, I suspect that probably most of the grains of material in the truck have a thin film of carbonate and hydroxide on the surface by the time these loads reach Moss Landing because of the ini-

(Testimony of L. H. Duschak.)

tial reaction between the calcined particles and the carbon dioxide and water vapor is very rapid.

Q. Then I will reframe the question: How far would you have to dig into this load from the top down to penetrate through the particles or pieces or fragments that had become wholly carbonated?

A. I haven't any reason to think that any of the particles had become wholly carbonated.

Q. Does that include those particles in that truckload that are of very fine minuteness?

A. There aren't very many very fine particles in a truckload.

Q. There are some, aren't there?

A. A few, yes.

Q. Addressing yourself to them.

A. Well, I would expect that particles of a size comparable to the stack dust particles might be pretty well carbonated. It all depends on what opportunity they have had to come in contact with the carbon dioxide and the moisture of the atmosphere, and that is, one might say, a more or less accidental thing, depending on where they were in the bin, how they were delivered to the truck—there is no ab- [349] solute regularity in the mechanical behavior of these particles.

Q. Well, even those very fine particles of no greater size than those that come out of the top of the stack, will many of those in the truckload still contain some oxide?

A. They might or might not, depending on the extent of their exposure to the atmosphere.

(Testimony of L. H. Duschak.)

Q. In an open truck aren't they fully exposed?

A. Well, we have to bear in mind that if we have a truck with a tight body—let us say that is comparable to a tumbler, here, which is open only at the top—

Q. Yes.

A. The top layer of the calcined material will tend to absorb the moisture and carbon dioxide in the atmosphere, so that neither of those reagents may penetrate to the lower levels of the materials in the truck.

Q. Do you mean by that that it depends on the available moisture and dioxide in the air that is available for the appetite of this dolomite in the truck?

A. It depends on that, and on the extent of the exposure of the particles to those reagents.

Q. Let us assume an extent of 18 miles of exposure.

A. That is no way of measuring exposure that I am familiar with.

Q. How would you measure it? By time?

A. In terms of surface and time.

Q. What time is consumed in hauling that in the 18 miles from the time of loading at Natividad until the time of arrival and dumping at Moss Landing?

A. Well, I suppose it might be on the [350] order of three-quarters of an hour, an hour—I don't know.

Q. Well, that would be fairly close. Doesn't it get down, then, to this: That if you had one or two

(Testimony of L. H. Duschak.)

or a very small number of particles moving out of the stack or over the highway through the air they would all return to carbonate rather quickly, but if you have a fairly large mass, there wouldn't be enough moisture and carbon dioxide in the air to fully react on them and return them to carbonates in the half mile or mile of travel through the air?

A. I don't understand your question, sir.

Q. I will put it this way? Depending on the size of the mass of particles that were coming out of the top of the stack, this mass of stuff, each particle of which has an appetite for moisture and other chemical ingredients in the air, its appetite for that does not depend on how large a mass of particles is coming out of the top of the stack as to whether or not they will all be returned to their carbonate form at the time they land on the Pista orchard?

A. Not in this sense, because in all cases we have an excess of carbon dioxide present. We have all the carbon dioxide coming from the dolomite being calcined, plus the carbon dioxide from the fuel heating the kiln, so we have, oh, many, many times the necessary amount of carbon dioxide to saturate all of these particles. Moreover, all particles are dispersed. Each one is entirely surrounded by atmosphere. It is an ideal condition for the absorption and [351] reabsorption of carbon dioxide.

Q. Well, does it come to this, that the end product going away from Natividad in the truck is chemically identical at the beginning with the end product stacked out, or is lost from the top of the stack?

(Testimony of L. H. Duschak.)

A. No.

Q. Wherein do they differ chemically?

A. The end product which is loaded into the trucks is, we may say, completey calcined dolomite, which may have picked up a small amount of carbon dioxide and moisture, whereas the material which ultimately becomes the dust escaping from the stack consists in the beginning of quite a proportion of uncalcined dolomite particles.

Q. In other words, what comes out of the top of the stack, the particles differ between themselves in all the range from wholly uncalined dolomite up to particles of fully-calcined dolomite and particles all the way in between in the stages of calcination, is that correct?

A. It is correct with one qualification, that any particle escaping from the stack will have already absorbed carbon dioxide to some extent.

Q. The carbon dioxide of the air?

A. Of the stack gas.

Q. Does that differ in any respect from the carbon dioxide of the air?

A. It is present in much greater concentration.

Q. In any other respect is it different?

A. Chemically it is the same substance.

Q. I thought so. Now, assume, Professor, that spread over a period of twenty-four hours there are four tons of particles [352] of stack loss that travel from a half mile to a mile to the Pista orchard as compared with 76 tons per 24 hours traveling, with that difference, en masse; would there be any dif-

(Testimony of L. H. Duschak.)

ference with respect to whether or not all of the particles went back to the carbonate form at the time of landing on the vegetation?

A. None, whatsoever.

Q. The difference in amount would make no difference to you?

A. No, because we still have a tremendous excess of carbon dioxide.

Q. By the way, you stated the other day the stack was 200 feet high, and the gentleman this morning gave a different elevation—

A. Yes, sir, I think I was in error.

Q. What is the height?

A. I do not know exactly. I had some preliminary plans and I haven't checked. I would be willing to accept Mr. Garoutte's statement as accurate.

Q. I do not want to press it. We can all make wrong estimates of height. At the moment you are not prepared to say what the height is, or approximately is?

A. Not with certainty, no. I saw some preliminary plans, but I have not examined the final plans.

Q. You spoke of taking some analyses a hundred feet up in the stack, as I understand it.

A. Yes. My impression now is I should have said about 70 feet up.

Q. Let me see. Do you correct your original testimony that the samples taken at a hundred feet were taken half way up the stack, whatever the height is?

A. No, it was more than half way up. [353]

(Testimony of L. H. Duschak.)

Q. Did you in taking those samples make any note or make any observation as to the height above the bottom of the stack from which you were taking them?

A. I think the photographs we have will show a platform which was specially built for sampling purposes, and they were taken at that point.

Q. If we assume for the moment, until we know better, that Mr. Garoutte is right in suggesting a height of around 120 feet— A. Yes.

Q. —then would I be correct in understanding you that there is only a further elevation of 50 feet to the top of the stack from the point where you took the samples? A. Yes.

Q. So, from that point up any change we have talked about or direct as necessarily occurring within a distance of 100 feet now turns out to be addressed to a situation where it is only half that further elevation, isn't it?

A. Yes, but I do not recall speaking of anything that took place in that specific dimension.

Q. At an elevation of 70 feet above the bottom of that stack, in taking your samples for chemical analyses, did you find any calcium oxide present in the particles? A. Yes.

Q. Did you find any calcium hydroxide present in the particles? A. No.

Q. You would not find the hydroxide until after it had escaped out of the stack, would you?

A. I did not test for hydroxide. That is the reason I did not find it. [354]

(Testimony of L. H. Duschak.)

Q. Perhaps we can pass the subject by saying you do not know at the moment whether there was any calcium hydroxide present or not at an elevation 70 feet above the bottom of the stack, do you?

A. I have reason to think that there was a small amount, yes.

Q. Now, you have never taken any samples at the top of the stack? A. No.

Q. In other words, you have never made any actual chemical analysis of the particles at the point where they escape from the top of the stack?

A. No.

Q. Is calcium oxide a caustic? A. Yes.

Q. Is calcium hydroxide caustic? A. Yes.

Q. Is magnesium oxide caustic?

A. Mildly so, yes.

Q. Is magnesium hydroxide caustic?

A. No, not in the usual sense of the word. May I explain?

Q. Surely.

A. The distinction there is in the matter of solubility. When we bring calcium oxide in contact with water it forms calcium hydroxide, which has an appreciable solubility with water. Neither magnesium oxide nor magnesium hydroxide have an appreciable solubility. Our Moss Landing process of precipitating magnesium hydroxide would be impossible if it were not for the very high insolubility of magnesium hydroxide in water. So that while in one sense we might say that magnesium oxide and magnesium hydroxide are caustic materials, they

(Testimony of L. H. Duschak.)

are ineffective as such because they are insoluble in [355] water.

Q. In any event, calcium oxide could be spoken of very simply and colloquially as a caustic lime, couldn't it? A. Caustic lime, yes.

Q. That is what it is in common speech?

A. It is one of the common terms for it.

Q. Is calcium oxide alkaline?

A. It is an alkali.

Q. Is the same true of calcium hydroxide?

A. Yes.

Q. How about magnesium oxide?

A. That is an alkaline oxide.

Q. How about magnesium hydroxide?

A. That is an alkaline hydroxide.

Q. You told us the other day you have made some studies of pollinization; you recall that, don't you? A. Yes.

Q. Page 206: "A. Yes, I have made some studies of the processes involved in pollinization and of the chemical circumstances which may affect that process."

Take the stigma in an apricot blossom. That is part of the fertilizing medium of the blossom, isn't it?

A. I would say part of the fertilizing mechanism.

Q. Mechanism—I will accept the statement. Now, does that stigma secrete or exude some substance?

(Testimony of L. H. Duschak.)

A. Yes, at a certain time in the development of the blossom it secretes a small amount of viscous fluid.

Q. Is that viscous fluid thus secreted part of the process of pollinization and fertilization?

A. Yes, that is an [356] essential part of the process.

Q. Is that viscous fluid acid or alkaline?

A. It is stated that it is slightly acid.

Q. Calcium oxide coming in contact with that would neutralize that acidity, wouldn't it?

A. If dissolved, and if the quantity were sufficient.

Q. Now, you say if it dissolved. That viscous fluid contains some  $H_2O$ , does it not?      A. Yes.

Q. Calcium oxide has a strong appetite for  $H_2O$ , has it not?      A. Yes.

Q. As a matter of fact, wouldn't a deposit of calcium oxide on that viscous fluid secreted by the stigma immediately draw out of that viscous fluid the water in it and into the calcium oxide?

A. If we are speaking of a grain of pure calcium oxide, the answer is Yes.

Q. Let us speak of a grain of calcium oxide that came immediately and directly from the calcium carbonate of that quarry on the hill there in Natividad. Wouldn't that have a strong appetite for the water or the  $H_2O$  in that viscous fluid of the stigma?

A. I don't know any way of getting a grain of pure calcium oxide from that quarry on the hill, because that is dolomite.

(Testimony of L. H. Duschak.)

Q. Then let us call it an impure calcium oxide that was originally quarried out of the rock on the hill. Would that impure calcium oxide have a strong appetite for the water or  $H_2O$  in [357] that viscous fluid of the stigma? A. Yes.

Q. And if that calcium oxide landed on that viscous fluid it would exercise its appetite, take the water of the viscous fluid, and turn the calcium oxide into a hydroxide, wouldn't it?

A. Yes, if the particle were calcium oxide on the surface.

Q. Wouldn't that simply be the difference of changing it from a slaked to an unslaked caustic lime? A. Yes.

Q. Generating the heat and with the destructive power that the slaking of caustic lime generates?

A. Yes, I would expect that. I would expect that if a particle of calcium oxide lands on some moist vegetable surface and reacts with moisture there, that there would be a certain amount of heat generated and probably a little burn or caustic action, as we call it, evidenced.

Q. If that occurred on the viscous fluid or secretion of a stigma on an apricot blossom would you not expect that it would destroy fertilization?

A. Without question.

Q. There is no doubt about that, is there?

A. No doubt about that at all.

Q. And it would not take but a very fine particle of calcium oxide to accomplish that, would it?

A. No, a rather small particle would—

(Testimony of L. H. Duschak.)

Q. How small a particle would accomplish that?

A. I have never tested that or calculated it, so I— [358]

Q. I will put it this way, then: Would a particle as small as the smallest particles of this stack loss that we have talked about do it? A. No.

Q. Would two of them do it?

A. In speaking of the size of these particles, I said that they ranged down to very minute particles.

Q. And up to 325 mesh, didn't you?

A. Yes, and coarser than that also. We have a whole range of particle size.

Q. Would one particle of a 325 mesh destroy the fertilization in the manner that we have been discussing?

A. You are assuming a 325 mesh cube of calcium oxide.

Q. A 325 mesh particle, whether a cube or not—a cube or sphere, or any of the geometrical shapes in between.

A. Yes, I would think a particle of that size that consisted of calcium oxide and nothing else would undoubtedly be sufficient to neutralize the stigma.

Q. Let us take a particle consisting wholly of calcium oxide. Let us take one particle consisting of one particle of 325 mesh that is around 40 to 50 percent calcium oxide, or in the percentage that the calcium carbonate is originally present in the dolomite ore up on the hill.

(Testimony of L. H. Duschak.)

A. Are you assuming the presence of some calcium carbonate also?

Q. No, I am assuming the presence at the moment only of that amount of calcium oxide in the particle.

A. Whatever else was present. [359]

Q. Whatever else was present in the original form, according to your testimony. Let us say magnesium oxide and these small traces of impurities we have talked about, which I will abandon for the moment.

A. If I understand, then, your question is whether a 325 mesh particle consisting essentially of calcium oxide and magnesium oxide, if it landed on a stigma, would—

Q. Destroy fertilization.

A. Yes, I think it would.

Q. By the way, there has been considerable said here about the war effort and post-war, peace activities for this metal. Can you tell me whether the stockpile of metallic magnesium in the country to-day, such as this process produces, is an over-production in about the same extent that aluminum was recently discovered to be?

A. I know that there is a large surplus of magnesium in stockpile at the present time.

Q. Just digressing for a moment, you know of the great extent of the aluminum cutback recently in production? A. Yes.

Q. Like anyone does; you read the papers.

A. Yes.

(Testimony of L. H. Duschak.)

Q. Isn't there a cutback right now in progress right now in the production of metallic magnesium such as you are producing right down here at Natividad? A. Yes.

Q. Hasn't it been just in recent months that the Kaiser or Permanente Metals Corporation magnesium plant at Lathrop has been shut down because of overproduction? A. Oh, at Lathrop?

Q. Yes.

A. Yes, that has been cut down recently. May I add [360] that that does not use the same process as Permanente.

Q. Does it end with the same result of metallic magnesium?

A. It may, but at Permanente they produce other than solid magnesium.

(Discussion off the record.)

Mr. Naus: Q. By the way, along this same matter of the war effort, this dolomite quarry on the hill at Natividad, is that something you need that is the only thing of its kind in the United States?

A. Oh, no.

Q. As a matter of fact, aren't deposits of dolomite pretty common throughout the United States?

A. Well, they are moderately common. I wouldn't say pretty common.

Q. I will put it differently. Take this dolomite quarry up on the hill at Natividad. Are there other deposits of this dolomite throughout the country that could be said to be in competition with it for

(Testimony of L. H. Duschak.)

the purpose to which it is being put, or that could be used for the same purpose?

A. None that I know of, in competition with it, if you are speaking economically and industrially.

The Court: Q. Does it depend on the material?

A. On the quality of the material and on its location with relation to other operations.

Mr. Naus: Q. Quality of material and location. Take quality of material first. Is there no other dolomite deposit in the country of as good a quality?

A. Oh, I am sure [361] there are many.

The Court: I am afraid we are going afield.

Mr. Naus: I thought we were going afield, if the Court please, when we got beyond subjects one, two and three on this Exhibit A the other day. I am merely trying to meet what was introduced then on direct examination. I will have to admit I am going afield. I shall try to limit it.

Will you read the last question and answer?

(Record read.)

Mr. Naus: Q. Are there no other dolomite deposits in the United States of equal quality?

A. There are, I am sure.

Q. Many? A. I think there are many.

Q. That reduces, then, to the matter of location, does it not, as to the uniqueness of this dolomite quarry at Natividad?

A. Yes, to location and ease of extraction of the dolomite.

Q. Would this be stating it fairly, then, that

(Testimony of L. H. Duschak.)

the selection of a quarry at Natividad is merely to get a cheaper cost of operating?

A. Well, I could not fully answer that. That is one obvious reason for locating this operation at Natividad.

Q. Then another thing: Whatever the reason for the selection of that quarry, couldn't you end up with exactly the same end product of metallic magnesium down there at Saratoga or wherever it is if there were no calcium plant at all near the quarry, but if the calcium plant were, for example, over at Moss Landing? [362]

A. Yes.

Q. And would that entail anything more than the additional cost of transportation of the raw dolomite from the quarry to Moss Landing over the lesser cost, the lesser travel of the calcium product over the same route?

A. I couldn't think of any other important consideration. There may have been some other advantages in locating the calcining plant close to the quarry.

Q. There is natural gas and fuel oil available at Moss Landing, isn't there?

A. I think not natural gas.

Q. Is there any difficulty about having some there if needed?

A. Well, we would have to ask the P.G. & E.

Q. In any event, you have natural gas in Saratoga, haven't you?

A. Yes.

Q. You use that to shock cool, don't you?

A. Yes.

(Testimony of L. H. Duschak.)

Q. Large quantities of it? A. Yes.

Q. It is piped right to you there?

A. Yes.

Q. You can get just as much there as you can at Natividad, can't you?

A. More, I believe.

Q. Let me put this question to you—not that I expect anyone but his Honor to pass upon the question of the injunction, but just to test this operation—if an injunction should issue against the defendant here, against depositing dust on the Pista orchard, and if the defendant here should conclude that that would entail shutting down the calcium plant at Natividad, you could immediately reconstruct that same plant at Moss [363] Landing and go right ahead with the production of metallic magnesium, couldn't you?

A. I don't think you could.

Q. Why not?

A. I do not think you could get the material.

Q. Then assume further that you could get the materials. Assume you could get the labor and materials to reproduce the plant at Moss Landing. Then isn't it the fact that any injunction here would entail no more, at the most, than the reconstruction of the plant, say, at Moss Landing or somewhere else?

A. I am not entirely able to say what the effects of the injunction would be, because I have not been told just what is the contents of the injunction.

Q. I can't tell you the contents. I can't even tell

(Testimony of L. H. Duschak.)

you there will be one, Doctor, but I am just testing this great interference with the war and the peace effort that has been talked about here. Assuming an injunction that enjoined the defendant from depositing any dust on the Pista orchard, then what? Couldn't you go right ahead with your whole process of putting out metallic magnesium by the simple method of putting up a calcium plant somewhere away from where it now is and at a distance that it would not deposit dust on the Pista orchard?

A. Theoretically it is perfectly possible, yes.

Q. I am having you assume the availability of materials and labor to put up a plant.

A. Yes, sure.

Q. That is all an injunction would entail, isn't it, that such an injunction would entail?

A. I do not think I am [364] qualified to answer that.

Q. Now, this quarry at Natividad, what do you as a metallurgist or an expert in this field, someone who has been down and looked the situation over and investigated—what do you estimate or say the probable tonnage of unquarried or unmined dolomite in sight to be?

A. I never made any estimates of the quantity of material there.

Q. Do you know whether there is enough to run more than a year, or on the other hand if there is enough to run for a hundred years, or do you know anything about it?

(Testimony of L. H. Duschak.)

A. I have reason to believe that there is enough to run for several years more.

Q. And by "several years" you mean approximately what—not being exact about it, but doing the best you can?

A. Five, ten or fifteen years anyway.

Q. Going back to a question I asked a while ago, and then I got diverted, can you give us any idea of the size of the stockpile or the extent at the moment of the overproduction of metallic magnesium?

A. You mean in the form of ingots, not this special dust they make at Permanente?

Q. In the form of ingots—that is the more usual or common form, isn't it?

A. That is the form that is used for casting.

Q. You convert from ingot to dust and vice versa?

A. You convert from dust to ingot at Permanente. [365]

Q. Yes.

A. No, I have no figure in mind at the moment as to the stockpile of magnesium ingot at the present time. I know it is large.

Q. Can we go at it this way: Couldn't you give his Honor any indication, for example, if the war with both enemies were for two years more, if there is enough magnesium on hand right now to keep the war going so far as anyone knows?

Mr. Moore: I do not want to interrupt, Mr. Naus, but I think we are getting away from the

(Testimony of L. H. Duschak.)

direct examination. We have an engineer whom we propose to call as a witness and who has all the facts you are asking the Doctor for.

Mr. Naus: If I had known that I would not have pressed so far here. I had no way, of course, of knowing what witnesses might be called. With that statement of counsel I will desist from any further questioning on this subject, if the Court please.

Q. Now, Doctor, take down around that calcine plant at Natividad; is there any predominant wind direction there? What I am trying to get at is what proportion of the total time, of the whole 24 hours a day, is the wind blowing in the direction from the stacks to the Pista orchard?

A. I have not examined the wind records in detail, so I really couldn't make a very good answer to that question.

Q. Have you any impression about that? You have been talking about wind. You wrote a report about wind. I want to test you a little bit here to see what we can learn about it. [366]

A. Well, I have some impression from that survey that I made in November 1942 in which I sought out the areas in which a visible deposition of dust had occurred, and it extended farther along the general line running from the plant toward the Pista orchard and beyond than it did in the opposite direction.

Q. Then from the standpoint of not being familiar with wind records or observation of the wind, but from the standpoint of a scientist or engineer

(Testimony of L. H. Duschak.)

going around and looking over the deposition of dust on the ground, the greater amount of dust was deposited in the compass direction that approximates the direction from the stack towards the Pista orchard?

A. Yes, but over considerably more miles, that is, I found it extending farther away.

Q. Was it in that compass direction that you found a range or a radius of about three miles from the stack in speaking of the deposit of dust?

A. Yes.

Q. Then taking the radii in other directions from that stack, the deposit extended less than two miles, didn't it? A. Yes.

Q. Do you know the location of the ranch of Mr. Wilmoth, who was on the stand this morning?

A. Approximately, yes.

Q. What is the compass direction from the stacks towards the Pista orchard, and what is the compass direction from the stacks towards Mr. Wilmoth's orchard?

A. I couldn't state those very accurately. [367]

Q. All right, then, I will pass that. In compass direction, whatever it is, from the stack toward the Wilmoth orchard, how far out do you find that, or did you find that deposit of dust?

A. I visited the Wilmoth orchard on one occasion and found a very, very few particles of dust showing on some foliage there.

Q. When was that?

(Testimony of L. H. Duschak.)

A. I think that was in the fall of 1942 when I made that survey.

Q. When you say fall of 1942, do you mean around November and December—

A. November.

Q. November 1942? A. Yes.

Q. The deposit of this dust on any vegetation in any direction has a cumulative effect, has it not?

Mr. Moore: Cumulative effect? I do not like to object, but cumulative effect on what, Mr. Naus?

Mr. Naus: I will change it.

Q. Much of this dust deposited on vegetation encrusts and sets on the vegetation, doesn't it?

A. Yes, it tends to remain on there, although I found cases where it had obviously washed off or washed down into little grooves along the midrib of the leaf. It did not appear to adhere very tightly, and I never observed any caustic effect, any burning effect, of the dust.

Q. When you visited Mr. Wilmoth's orchard in November 1942, that was the only occasion on which you visited it, wasn't it? [368]

A. That is my best recollection, yes.

Q. At the time of your visit the calcine plant had not been in operation more than two or three months at the most, had it?

A. About three months.

Q. So that at that time there was very small cumulative effect of the encrusting of this dust on any vegetation anywhere near the Natividad plant, isn't that true?

(Testimony of L. H. Duschak.)

A. There obviously had been only three months in which dust could have accumulated.

Q. From whatever amount you saw there in November 1942, if you had gone there at some later date, say in 1943, up until August 1943, you necessarily would have expected to find more deposit encrusted on Mr. Wilmoth's vegetation, would you not?

A. It all depends on whether the vegetation had continued, persisted, so to speak.

Q. Yes.

A. I found later in 1943 when I went over that same territory plenty of evidence of the dust having been washed off from leaves, presumably by rainfall or by fog condensing.

Q. At the time you visited this gentleman's orchard in November 1942 were there any leaves at all on his apricot trees?

A. I think not. I think that I looked at weeds and other growth at that time.

The Court: Your assistant has arrived, Mr. Reporter. Give him an opportunity. We will take a recess for a few minutes.

(Recess.) [369]

Mr. Naus: Shall I proceed, your Honor?

The Court: Yes.

Mr. Naus: Q. Now, Doctor, this matter of whether the calcium is in oxide or carbonate form when it lights on the vegetation in the Pista orchard has to do only with the qualitative effect of the cal-

(Testimony of L. H. Duschak.)

cium, does it not, with respect to preventing fertilization?

A. No, very definitely with the quantitative effect.

Q. Whether it has or has not fully returned to carbonate has to do merely with whether it is caustic?

A. Yes, whether it is a caustic alkali or an essentially neutral substance.

Q. Assume for the moment particles that have fully returned to the carbonate form of calcium, there could be a quantitative effect of them, could there not, on the fertilizing medium and processes of an apricot blossom?

A. I have no reason to think that it had any effect on the fertilization.

Q. Well, could not there be a sufficient deposit of particles of calcium carbonate to physically or manually obstruct fertilization—to act as a contraceptive?

A. There could conceivably be a sufficient pile-up of inert articles, let us say, to prevent the pollen from touching the stamen.

Q. It wouldn't take very many particles, would it, in the minute space involved in the fertilizing medium and processes of an apricot blossom to manually or physically act as a contraceptive and prevent fertilization?

A. Well, it would have [370] to be a continuous coating. The pollen grains are pretty small, and the

(Testimony of L. H. Duschak.)

stigma does not have to be covered with pollen. Just a few grains resting there will do the trick.

Q. Does the pollen grain have to travel down the style?

A. Well, a pollen grain sprouts in a way something like the sprouting of a seed, and a filament from it travels down the style into the ovary.

Q. It enters the stigma first and then travels down?

A. It sprouts at the stigma and then travels down the style.

Q. What is the inside opening of the style in an apricot blossom?

A. It is a very minute channel.

Q. Very minute? A. Yes.

Q. What is the diameter of that channel?

A. Well, I have never measured one; I don't know. It is microscopic.

Q. Microscopic. Let me ask this: If a particle of calcium carbonate of 325 mesh entered that style, would it fully obstruct it and act as a contraceptive?

A. No, because there are many little tubules, if you like, which communicate with this channel running down it. This process of the development of the pollen grain, I think, can be fairly likened to the germination of the seed and the travel of the root down into the ground. It more or less forces its way through—into the soil.

Q. It has to travel the full length of the style, does it not? A. Yes. [371]

(Testimony of L. H. Duschak.)

Q. To reach the base or the ovary?

A. Yes.

Q. To fertilize? A. That is right.

Q. Would it take more than one or two particles of calcium carbonate of 325 mesh to accomplish that—to accomplish the obstruction somewhere in the full length of that style before reaching the ovary?

A. Well, I really don't know. I have an idea if a little particle were in there, that the filament from the pollen grain would grow around it.

Q. Let me ask you this, then: As you sit there on the stand suggesting to his Honor that you are prepared to give him some expert information about the pollination in an apricot orchard, can you or not say on your oath definitely and positively one way or the other whether or not particles of calcium carbonate running 325 mesh and smaller—whether they would physically obstruct the style and prevent fertilization getting into the ovary?

A. If there are enough of them, yes.

Q. How many would it take?

A. Well, I couldn't—

Q. In your opinion, or do you know?

A. No, I don't know off-hand. I could make some calculations.

Q. I see. Now, another thing: How does pollination occur—is it self-pollination or cross-pollination in an apricot blossom?

A. It is believed to be both.

(Testimony of L. H. Duschak.)

Q. Well, now, you are the only one who has gotten up there to put yourself forward to his Honor as an expert. Which is it?

A. Both. [372]

Q. Both?

A. It may be either. In one blossom it may be self-pollinization and in another blossom it may be cross-pollinization.

Q. In what manner does pollination in an apricot orchard predominantly occur?

A. I don't know. My impression is that there is quite a little of both.

Q. This cross-pollination—is that air pollination or insect pollination that occurs in an apricot orchard? A. It may be both.

Q. Which is it? A. Both.

Q. Take up insect pollination. If you have a considerable volume or mass of fine particles of calcium carbonate of 325 mesh or smaller in the air, isn't that something that insects shun and go away from?

A. Not—I don't know that they do.

Q. You don't know one way or the other do you?

A. No; I have seen plenty of insects along dusty roads.

Q. Flying in a cloud of fine dust?

A. Yes, mosquitos lighting on my face.

Q. Now, are you prepared to reason and testify from that that the insects that do the insect pollination in an apricot orchard, whether they will or

(Testimony of L. H. Duschak.)

will not shun a large mass of particles of calcium carbonate coming out of the Natividad stacks?

A. Well, I have never seen any situation anything like that—any large cloud of particles and a swarm of insects, so I really don't know. [373]

Q. Now—

A. I might say that no fall of particles that I have ever witnessed around Natividad seemed to be anything that insects could possibly notice. I have never seen a particle actually fall on a surface. I have seen surfaces on which particles have fallen, but I have never actually seen a particle fall.

Q. I am frank to say—perhaps you can tell us, how small a particle these pollinizing insects can see.

A. I don't know.

Q. Coming back to your answer the other day that, basing it upon your tests of a few days ago and reasoning from that, you reached a maximum of 76 tons a day of dust coming out of those stacks; you recall that range of 56 to 76?

A. No; that was the possible dust production, less the amount which I determined to escape from the stacks.

Q. Then before the Cottrell system was installed, the precipitators, what was the total tonnage of dust escaping per 24 hours from the top of those stacks when the two kilns were running full production, full feed?

A. I have no information on that, except I know it was considerably less—or perhaps I should say

(Testimony of L. H. Duschak.)

I have good reason to believe it is considerably less than this larger amount that you just mentioned.

Q. What is the maximum that you would put?

A. Oh, for the two stacks I should think—

Q. Yes, full feed. A. Well—

Q. 24 hours.

A. The full feed before the Cottrell was [374] installed was less than the full feed after the Cottrell was installed.

Q. Whatever the full feed was before that Cottrell was installed, assuming that full feed before that installation, what was the total amount in tons of dust escaping from the top of the two stacks?

A. My best information on that subject would be the information which I obtained from Mr. Garrouette and which he reported this morning, which was based on his material balance.

Q. Can you make a short answer in tons, in numerals? A. Say 30 tons.

Q. All right. You can say, can you not, that if that dust was blowing toward the Pista orchard, it would be blowing over there at the rate of 25 or 30 pounds a minute?

A. Oh, my, no. It will spread out over a big area. Only a small fraction of that dust would actually travel over the Pista orchard.

Q. Now, has it spread over a long area at any given moment when the wind is in one direction, or is it just a swath in the direction of the wind?

A. No, it spreads out in sort of a fanlike formation.

(Testimony of L. H. Duschak.)

Q. It would be several hundred trillions of particles of dust per minute, wouldn't it?

A. Yes.

Q. Per minute?

A. Yes; if we assume that they are all very fine particles. [375]

Q. I am assuming the particles that you have been testifying about.

A. Well, now, just a moment. I testified about 46 micron particles and about 5 micron particles and about 10 micron particles, but there are particles coarser than that and particles finer.

Q. Having the number of pounds we are dealing with, wouldn't you say that there is at least a trillion of those particles blowing in the direction of the Pista orchard per minute when the wind is that way? A. Blowing in the direction, yes.

Q. When the wind is that way?

A. I think that is undoubtedly true.

Q. With that volume of dust in the air and as a pollination expert, tell me whether or not the pollinating insects would shun that amount of dust.

A. Well, we have got to get the picture a little clearer. From my examination of this dust cloud — smoke cloud, if you will, —

Q. Dust, I prefer.

A. Dust cloud; very well. It has risen considerably above the top of the stack and spread out in considerable dimensions. From this smoke stream or dust stream, if you like, particles are continually descending toward earth.

(Testimony of L. H. Duschak.)

Q. And the nearer the stack the greater the amount?

A. Yes. A good deal of the material falls right on the Natividad Permanente property or within a few hundred yards of the base of the stack. The coarser particles fall there. The finer particles go sailing off. But I have never seen any condition there which would [376] suggest anything that one could call a cloud of dust in the vicinity of the Pista orchard when I was down there in the fall of 1942. Before the precipitators were in, I saw this dust cloud coming from the stack, and I could see it against the blue sky, but up along the Gabilan Creek road near the Pista orchard I never saw anything that you could call a cloud.

Q. Let's get down to the one thing that I want to know if you can tell us anything about it—whether with the volume of dust particles we are speaking of, whether or not the insects, the pollinating insects, would tend to shun that mass of dust.

A. I don't think that the insects would know that there was any dust around.

Q. They would be wholly unaware of it, would they?

A. That is my impression. Of course, I am not an insect; I don't know how they feel about it.

Q. Now, let's see. If at some time in the air there were any particles in there that still were in the oxide form—hydroxide form—and having in mind the moisture in the insect, they would tend to burn or dry the insect up, wouldn't they?

(Testimony of L. H. Duschak.)

A. Yes.

Q. Would the pollinating insects shun that?

A. There aren't any of that kind of particle present.

Q. If there were would they shun it?

A. Again, I never asked the insects. I don't know.

Q. Is that a flip way of saying you don't know?

A. No, I don't mean to be flip at all, but we kill a good many [377] insects with various kinds of sprays, and I don't know whether the insect would be at all aware of, let us say, a particle of caustic lime. It is conceivable that some of them would perch right on it and kill themselves in that way.

Q. Are you basing that on a scientific study or basing that upon conjecture or guesswork or a partisan view—which?

A. Well, I am basing that on my knowledge of insecticides. I helped to manufacture insecticides for a number of years and knew something of their use. There are certain contact insecticides that kill insects by just touching their bodies.

Q. You spoke of air pollination, I think, too, as well—the pollen being carried by the air from one blossom to another, is that correct? A. Yes.

Q. As these particles of dust were descending from the atmosphere down onto the Pistal orchard, would or would not those particles—any one of them be enough, on coming in contact with that air-borne pollen, that very light pollen—be enough

(Testimony of L. H. Duschak.)

to gum with it or clump with it and bring it down to the ground instead of into another blossom?

A. I am quite sure that they wouldn't; those fine dispersoids tend to stay away from one another. They don't tend to flocculate or coagulate.

Q. Have you ever made any personal study or ever done any reading upon the subject?

A. Well, I have made a good deal of study of the behavior of fine particles in the atmosphere, yes.

Q. Fine particles of pollen?

A. No, of various kinds of dust. [378]

Q. I am speaking of pollen. Have you ever made any personal study or experiment yourself or ever read anything in the literature anywhere of any kind from which you can say one way or the other, outside of a partisan guess, whether these particles of dust out of the top of the stack would clump or adhere to or with air-borne pollen and tend to bring it to the ground instead of letting it drop into a blossom?

Mr. Moore: I am going to object to the question, your Honor, as argumentative, and particularly that portion of it, "aside from partisan bias," or something of that kind that Mr. Naus threw in there.

Mr. Naus: I didn't say "partisan bias"; I said "partisan guess." I asked him if he has anything beyond or in any form different than a partisan guess on which to base his answer.

Mr. Moore: There is no evidence here that he made any partisan guess.

(Testimony of L. H. Duschak.)

The Court: You are assuming a fact not in evidence that he is making a partisan guess.

Mr. Naus: I don't know. I thought that letter is enough *prima facie* showing that he is a partisan—that letter he wrote back in November 1942. If that didn't make him one, I don't know how to go about establishing a foundation for one.

The Court: I haven't so concluded yet.

Mr. Naus: Then I will reframe the question, with your Honor's permission. [379]

Q. Have you ever made any personal study or experiment yourself or read anything in the literature anywhere on the subject with respect to whether or not particles of dust in the air will merge or adhere—merge with or adhere to air-borne pollen and tend to cause it to drop to the ground rather than in another blossom?

A. I can't recall having read anything about pollen particles, but I think I can answer your question just on the basis of the behavior of fine particles generally.

Q. I just want the question that I asked, not the one that you prefer me to ask, Doctor. Let's stay with it.

A. Will this satisfy you if I say that if we have a pollen particle here, and let us say a 325 mesh particle hits it amidship and the pollen particle sticks to it, undoubtedly they will go to the ground together and we will have killed one pollen grain. That is perfectly conceivable.

(Testimony of L. H. Duschak.)

Q. Just to complete the question and answer I will break it down, then. No. 1: Have you ever made any personal experiment in that field?

A. No.

Q. Have you ever made any personal study in that field—that narrow field?

A. I have. My study of the behavior of fine particles in the air would include pollen particles. They are in a sense not different from other particles except they are of a particular composition.

Q. I am asking you whether you have ever made any personal study of pollen particles as such.

A. Of their behavior in [380] the atmosphere?

Q. Yes. A. No.

Q. Have you ever read anything in the literature anywhere with respect to pollen particles as such having particles of dust fall upon them?

A. No, I can't recall that I have.

Q. Now, whatever the height of the stack down there, was the height of the stack determined in the design before or after the Cottrell precipitator was decided upon?

A. Before. The stack was designed as part of the original plant.

Q. What is the relation between the height of the stack and the efficiency of the Cottrell precipitator system with respect to preventing dust particles from escaping from the top of the stack?

A. Absolutely no relation. The stack could be 10 feet or a thousand feet high.

(Testimony of L. H. Duschak.)

Q. It wouldn't make any difference to that system?

A. The effect of changing draft as related to the height of stack would have to be considered; but as far as the functioning of the Cottrell system itself, it makes no difference into what the gases from Cottrell are discharged; they might be discharged ground level or carried by a long flue into anything.

Q. The operation of this electricity in the way that you have told us and the way you have shown on the board, does that result in a uniform capture of the particles there throughout the length of the stack, or does it capture more at one spot in the stack than another?

A. This Cottrell precipitator [381] is a structure entirely separate from the stack and simply connected with it by a flue, and sometimes with a fan in between. Possibly my diagram misled you to thinking that I was indicating the stack.

Q. I thought you were.

A. No, no, that was simply illustrating the principle of the Cottrell process. No, the Cottrell precipitator is an entirely separate and different structure with this electrode system in it; just a big chamber, if you like, which has a gas inlet at one end and a gas outlet at the other, and this gas outlet is then connected to a flue or stack, or whatever one wishes to connect it to.

Q. Well, the dust enters the precipitator before any of it enters the stack, is that right?

(Testimony of L. H. Duschak.)

A. That is true.

Q. Now, you spoke something in that letter of November 1942 about the impossibility of drying apricots in the neighborhood of the Anderson and Pista orchards. Why is that?

A. The gist of my remark was that if the plant continued to discharge dust at the rate at which it had been discharging it during the—in the period prior to my visit, I judged that that dust would accumulate sufficiently on drying apricots to interfere with their marketability.

Q. Well, assuming four or six tons a day coming out of each stack and assuming the wind carrying it in the direction of the Pista orchard, and assuming that that is occurring during the time apricots are out on trays on the ground and being [382] dried, what effect, if any, will that dust have on those drying apricots?

A. It is my impression that there wouldn't enough dust fall on the trays of apricots on the Pista ranch, let us say at the present time, with the Cottrell operating as it is, to have any noticeable effect on the marketability of the dried fruit.

Q. Would it make that dried fruit any grittier than it would be if the dust were not in the air?

Mr. Moore: You mean now or before, Mr. Naus? What period of times are you referring to?

Mr. Naus: I am speaking of any time when there is four to six tons a day coming out of the stack and the wind taking it in the direction of the Pista ranch.

(Testimony of L. H. Duschak.)

A. Well, I am doubtful whether enough dust would fall on a given tray of apricots during the drying period to be noticeable.

Q. Would some dust fall on it?

A. Yes, undoubtedly some dust would.

Q. But you don't think that that would interfere with the drying apricot at all; is that your answer? A. That is my answer.

Mr. Naus: That is all. [383]

#### Redirect Examination

Mr. Moore: Q. Doctor, there has been reference to the 325 mesh. Now, will you describe the character of the product that is placed in the trucks for the purpose of hauling over to Moss Landing, its general appearance, size and characteristics?

A. One would describe it generally as a granular material consisting of fragments of, say, half an inch or so in diameter, ranging down to perhaps grains the size of a mustard seed.

Q. Generally about the size of the end of your finger?

A. The larger pieces, yes; and then finer particles down to quite small grains,—very little what we would ordinarily call dust.

Q. And those lumps, if we call them that, were of a combination of magnesium and calcium oxide, is that correct? A. Yes.

Q. And they are fed into this truck—I believe

(Testimony of L. H. Duschak.)

you said some of the trucks were opened and some sealed?

A. That is my best impression, yes.

Q. And do those lumps become partially carbonated, in your opinion, in the trip from Natividad to Moss Landing?

A. It is my opinion that those which are exposed to the air will pick up a little carbon dioxide on the surface; in other words, the surface of many of those pieces will acquire a slight coating of carbonate.

Q. And I assume that those pieces which are on the top of the truck, if we may term it that, the top layer, are the ones [384] that would pick up the carbon dioxide?

A. Yes, those that are most exposed to a changing atmosphere.

Q. Those that are deeper down in the truck would pick up less, is that correct?

A. That is correct.

Q. Now, with this dust—I believe you have already said it is practically microscopic—to see those particular grains—

A. The stack dust is very fine. Many of the grains are microscopic, yes.

Q. No dust comes out like lumps the size of your finger, or anything of that sort?

A. From the stack, no.

Q. And is the chemical constituency of those dust particles the same as the lumps, if you want

(Testimony of L. H. Duschak.)

to term them that, that are hauled over to Moss Landing? A. No.

Q. In what respect do they differ?

A. These dust particles are partly carbonated.

Q. When they leave—

A. When they leave the stack, and that in two senses. Some of them consist of raw dolomite—the dolomite dust that has been picked up in the cooler end of the kiln and not ever been calcined; and others consist of partially or wholly calcined particles which have been recarbonated on the surface.

Q. Now, you said that, in your opinion, as I gathered, that from examination, by the time these dust particles reached the Pista ranch they became carbonated, is that correct?

A. Yes, that is my opinion, that they are pretty well, if not [385] completely, carbonated by the time they reach the Pista ranch.

Q. By that you mean they have become neutral and they have lost their causticity, in that correct?

A. Yes.

Q. Did you examine the foliage on the Pista ranch? A. Yes.

Q. Of the trees on it?

A. Yes, I made some examinations of the foliage there this year.

Q. And let me ask you, if these dust particles were of a caustic nature, would there be any evidence of its causticity so far as the foliage is concerned?

(Testimony of L. H. Duschak.)

A. I would expect to find some evidence of burning, of caustic action on the foliage.

Q. On the foliage. We will take the leaves. Would you describe what, in your opinion, would be the effect of caustic material being applied to those leaves?

A. Well, it would produce a little brown or yellow spot on the leaf.

Q. You examined the foliage there. Did you find any evidence of causticity on the leaves or foliage of the Pista ranch?

A. No, I could find none, whatever.

Q. And it is your opinion that this dust had returned to its original form of calcium carbonate, is that correct?

A. Completely, or nearly so, yes.

Q. Now, you were examined and questioned in regard to fertilization and pollinization. Would this calcium carbonate, as you have described it—in your opinion, would that affect the pollination of that apricot orchard—and I am referring now to 1943.

A. The only way that I can think of that it might affect it is by assuming the extreme case we discussed a few moments ago, where there is a sufficient pile-up of calcium carbonate grains to completely cover a stigma and blind it mechanically.

Q. You saw that ranch; you visited it in '42, while you were down there?

A. No, I didn't go on the Pista property in 1942.

Q. When did you go on the Pista property?

(Testimony of L. H. Duschak.)

A. I think it was in November, 1943. If I may just refer to my notes here—no, it was on December 3, 1943, that I first went on the—

Q. Did you observe any deposit of dust at that time on the foliage?

A. Yes, I remember observing dust on the foliage.

Q. Could you tell by that observation how long that dust had been there—how long it had taken to accumulate?

A. No, I had no way of knowing that, except by noting whether the plant was one that carried its leaves over the winter or shed its leaves. In amplifying that, I might say, not on the Pista ranch, but in the vicinity, we found some live oak leaves that had a coating.

Q. From your observation of the ranches and orchards in the neighborhood and from your observation of the plant, itself and its operation, would you say that there was at the time a sufficient cloud of dust to interfere with the pollinization?

A. No, I can't conceive that under any conditions there could have been a sufficient cloud of dust to interfere with pollinization.

Q. Then if I understand you correctly, in your opinion did this [387] dust, either by reason of its causticity or lack of causticity, or by reason of the volume, have anything to do with any lack of fertilization in the years 1943 and 1944?

(Testimony of L. H. Duschak.)

A. Probably none at all; but possibly a very slight effect in 1943.

Q. Very slight. Can you explain that further?

A. I base that statement on the fact that the quantity of dust was undoubtedly greater in 1943 than in 1944, and it is possible that a few of these dust particles containing some uncarbonated oxide in the center, might have reached the blossoms in the orchard in 1943; but I consider that the probabilities of that happening are pretty small.

Q. You think they were quite small?

A. Quite small, yes.

Q. Now, you were asked in regard to this dolomite deposit. Are you familiar with the dolomite deposits in this country?

A. Not particularly. I know of them in a general way, but I have never made any special study of them.

Q. Do you know why that particular dolomite deposit there was chosen by the Permanente people?

A. One reason was its convenient location, and another the fact that the calcium-magnesium ratio was so favorable. The term "dolomite" embraces quite a range of material, with varying proportions of calcium and magnesium; and for the purposes of the Moss Landing operation, this dolomite, or the particular composition there are Natividad was particularly desirable.

Q. In other words, we may put it this way:

(Testimony of L. H. Duschak.)

The percentage of [388] calcium carbonate and magnesium carbonate in that particular deposit are particularly favorable for utilization, is that correct?

A. Yes, that is correct.

Q. Now, the use of sea water at Moss Landing is another very vital portion of this process, is it not?

A. Yes.

Q. And the shock-cooling of the material at Permanente is a final and third step, is that correct?

A. Well, that is an essential step in the production of this extremely finely-divided metallic magnesium that is used for ammunition purposes.

Q. In other words, to have this process, if I understand it, you have to have the raw dolomite, plus sea water, and then this process that has been put in at Permanente, is that correct?

A. Yes.

Q. Now, you referred to the metallic magnesium. Mr. Naus asked you if there wasn't a slowing or shut-down of the manufacture of metallic magnesium. Do you know whether or not, at these plants at Moss Landing and at Permanente, there are other materials produced other than metallic magnesium?

A. Well, at Moss Landing they produce some dead burned magnesium oxide which is subsequently used in making basic refractories for the steel plants. Then at Permanente they are not producing metallic magnesium in ingot form at the present time, except on a small experimental scale. Their principal output is in the form of this ex-

(Testimony of L. H. Duschak.)

tremely finely-divided condensate, and is the result of shock-cooling with natural gas. That is a [389] product which has a unique value for incendiary bombs of various kinds.

Q. Is that manufactured elsewhere in this country, do you know?

A. No, nothing like that is produced anywhere else in this country.

Q. And that is one of the main products now being produced at the Permanente plant?

A. That is correct.

Q. And that is used in incendiary bombs in the present war? A. Yes.

Q. So far as you know, there is no other plant in the country that produces that, is that correct?

A. I know of no other such plant.

Q. You stated in your letter that you felt that there might be some interference with the marketability of the dried apricot. Just what did you mean by the marketability?

A. Well, I mean dried fruit that is covered with dust is not attractive to the buyer.

Q. In other words, during the drying season, if there was sufficient dust deposited on it, it would make it rather unpleasant to eat, is that right?

A. Yes.

Q. Do you know whether it did interfere in either 1943 or 1944 with the marketability of any apricots grown by Pista?

A. I have no knowledge on that subject.

Q. You don't know whether his apricots sold at the market price or not?

(Testimony of L. H. Duschak.)

A. You refer to the dried apricots?

Q. Yes. [390] .

A. No, I don't.

Q. There has been offered here in evidence, Doctor, a report by Paul J. Anderson, which is Plaintiffs' Exhibit 8. I believe you have a copy of that.

A. Yes, sir, I have another copy.

Q. You have had an opportunity of studying that report, have you?

A. Yes, I have read it through.

Q. Now, will you state *that* the effect of the report is in substance? I mean just in a general way, because it has not been read, Mr. Naus.

Mr. Naus: What report are you speaking of now?

Mr. Moore: This Anderson report.

Mr. Naus: If the Court please, I object to that as calling for secondary evidence of a writing. It is printed; it is in the English language. The Court doesn't need any witness or anybody else to tell him what the report shows. Objected to as calling for secondary evidence.

Mr. Moore: Well, the objection is probably good. I will withdraw it.

Q. Now, you have read this report, have you?

A. Yes, sir.

Q. And it has to do with a series of experiments conducted by one Paul J. Anderson, relative to cement dusts in and about Hudson, New York, is that correct? A. Yes.

(Testimony of L. H. Duschak.)

Q. And he outlines in there various analyses that he has made of that particular dust and various experiments that he conducted, and you are familiar with his report in that respect?

A. Yes, I am. [391]

Q. Now, if you will turn to that, I will ask you if in your examination, that represents a condition that existed in and about Permanente and the Pista ranch, and if it does not, in what particulars it differs, and why.

A. The circumstances investigated by Mr. Anderson are not disclosed as completely as information has been in regard to this Natividad plant and the Pista ranch; but within the limits of the information provided by Mr. Anderson, there are a number of points which indicate to me that Anderson's findings are not quite pertinent as regards the Pista ranch situation.

The dust came from a cement plant, not from a plant that was calcining dolomite. It mentions here, for example, on page 60: "During the entire blossoming season that year, a continuous south wind blew the dust from the mills onto a cherry orchard where our laboratory was established." There is a prevailing wind continuously in one direction, which is not the situation at Natividad.

And mention is made of a test here showing that the dust was falling at the rate of 2-1/2 tons per acre per month. That is fifteen times, I believe, the amount of dust falling that Mr. Twining tes-

(Testimony of L. H. Duschak.)

tified to. As I recall, his testimony was 2 tons per acre per year.

So that in respects like that, I find there are a number of ways in which the situation reflected in the Anderson report does not fit the situation we are discussing around Natividad. [392]

Q. I notice, Doctor, in this report I believe they found calcium oxide and magnesium oxide. I do not find in there any mention of calcium carbonate or magnesium carbonate. Can you explain the fact that in this report they only apparently found the oxide and did not find the carbonate?

A. I take it that you are referring to the analyses reported on, for example, pages 58 and 59.

Q. Yes.

A. Well, these analyses are set up in a conventional form, which do not indicate directly whether the calcium and magnesium compounds were present as oxide or carbonate; but in interpreting the analyses as a chemist would, I would say that the analyses showed that this dust contained both calcium oxide and calcium carbonate. There is a statement—I am not sure I can put my hand on it—yes, a statement here: "Nearly 8 percent of the dust is lime that is soluble in water."

Q. Where are you reading from?

A. This is from the middle of page 60. It is an item marked "(3)", in the third paragraph on page 60. That paragraph continues:

"The soluble lime is the cause of the extreme alkalinity of the dust and, as will be

(Testimony of L. H. Duschak.)

indicated below, is probably the source of injury to the fruit blossoms."

Then, in conjunction with that, we should note what the report states later on describing some laboratory experiments on the effect of this dust and the extracts from this dust on the growth of pollen. It states, for example, on page 65, in [393] substance, that if a portion of the cement dust is extracted with water and tested immediately with phenol phthalein, it will be found to show an alkaline reaction, that such a solution will interfere with the growth of pollen grains. This refers to the results of controlled laboratory tests in which there were control experiments with pollen run at the same time. And it states further:

"If, however, the drop is allowed to stand until neutraliaztion occurs and the pollen then put in, it germinates almost as well as the checks."

What this describes is very much the same thing that I have described, namely, when the dust particles are recarbonated, they become as innocuous with respect to effect on pollinization as this solution which has been exposed to the air, and, as the author explains here, has absorbed carbon dioxide from the air and caused crystals of calcium carbonate to separate out from the solution. So that, as far as I can see, Mr. Anderson's findings and my independent conclusions are quite in harmony with regard to the behavior of these kinds of dusts.

(Testimony of L. H. Duschak.)

Q. And it is your opinion that this chemical process that he refers to here—that he refers to, that if the drop is allowed to stand until neutralization occurs—that that has occurred in the dust that was deposited on the Pista ranch?

A. Yes. That is substantially the same process as the recarbonization of the dust particles that I described as taking place [394] on contact with air containing moisture and carbon dioxide.

Mr. Moore: May we adjourn? I would like to adjourn, if I might, your Honor. I am not sure that I have any further questions of Doctor Duschak. I think I am practically through; I might want to ask a few more.

The Court: If you do, you can excuse him from the stand and call your next witness.

Mr. Moore: Shall we proceed now with the next witness?

The Court: Yes.

Mr. Moore: Mr. Packard. Pardon me; do you want to examine?

Mr. Naus: Yes. Have you finished with him?

Mr. Moore: Could I have that letter? I think I have no further questions, Mr. Naus.

Mr. Naus: Q. Doctor, in that Anderson study—

Mr. Moore: Oh, pardon me for interrupting. You did call his attention to a book here, Mr. Naus. I don't know whether you want to introduce it or just what the status of this article in this book is.

(Testimony of L. H. Duschak.)

I haven't examined the doctor with regard to this statement.

Q. Have you read this text?

A. I read the chapter that Mr. Naus referred to, yes.

Q. And that is Chapter X, commencing on page 201, is that correct?

A. Yes, I read just that short paragraph that refers to the effect of cement dust. [395]

Q. And that refers to cement dust injury, does it not? A. Yes.

Q. And refers also to the Anderson report that you have just referred to?

A. Yes, this paragraph on page 201 of this book by Heald, Manual of Plant Diseases, in the paragraph entitled, "Cement Dust Injury," gives what might be described as a brief summary of the paper by Mr. Anderson.

Q. It refers to that article of Anderson?

A. It refers to that article and recites briefly the substance of the Anderson article.

Q. And would your comment on that particular text be the same as your comment on the Anderson report?

A. Yes, I think so. We might note that this Anderson report was published in 1914; that this book was published in 1933, and that this Anderson report is the only one that is cited on this particular topic. And I infer then that the author did not find any other work than this one report of Anderson's. This is—and I say it in that way, be-

(Testimony of L. H. Duschak.)

cause a book which is called a Manual of Plant Diseases, in general contains a pretty complete bibliography and complete reference to any pertinent articles. So I conclude that the only article that the author found which seemed to touch this subject of cement dust injury was this one Anderson article nearly twenty-one years old.

Mr. Naus: Have you now finished?

Mr. Moore: I have now finished. [396]

#### Recross Examination

Mr. Naus: Q. Doctor, referring to that Anderson report about which Mr. Moore questioned you, that, you say, has reference to cement dust as distinguished from dolomite dust in our case?

A. Yes.

Q. Cement dust, insofar as the Anderson report relates to injury to a fruit orchard, relates to calcium oxide, doesn't it?

A. It discusses calcium oxide, yes.

Q. Well, doesn't it put its finger on calcium oxide as the cause of the injury to the fruit orchard?      A. Yes.

Q. And chemically it is exactly the same calcium oxide that would be developed through the calcining of dolomite ore, isn't it?

A. Yes, calcium oxide is calcium oxide wherever you find it.

Q. That is what I thought. Now, when you drew the distinction between the Anderson report as referring to cement dust and this case referring to

(Testimony of L. H. Duschak.)

dolomite dust, what distinction were you drawing?

A. When we are considering the effect of a dust from a given source on, let us say, an orchard, we have to know about a good many things. I mentioned that this report refers to this strong wind which drove the dust directly from the cement plant and which blew continuously during the blooming season. And it does not tell us, though, just what kind of a cement plant it was, whether it was wet process or dry process, and what the temperature in the stack was. In [397] the absence of that information, it is difficult to say whether the circumstances observed there were really comparable with those at Natividad.

Q. But—

A. If the stack—to show you exactly what I mean, if it was a dry process plant, as I suspect it was—a short kiln—the temperature in the stack was undoubtedly very much higher than the temperature in the Natividad stack and the process of calcination of limestone particles might actually go on in the stack instead of reversing itself as it does at Natividad. That, for example, would explain the presence of caustic lime in the cement dust which they caught in this orchard near Hudson and be a distinction from the situation as I picture it at the Pista orchard.

Q. There is this difference between the two cases also, is there not, Dotcor: that in the Anderson case with the dust falling within a radius of two miles, Anderson set up a laboratory within that area and

(Testimony of L. H. Duschak.)

captured and analyzed the dust as it fell upon vegetation and found it to be a calcium oxide?

A. He found that it contained in one case some 8 percent of soluble calcium oxide.

Q. In other words, when he captured the dust just as it had landed on the vegetation with his field laboratory there, he found that calcium oxide did not fully return to a carbonate by the time it landed on the vegetation, didn't he?

A. That is correct. [398]

Mr. Naus: That is all.

Mr. Moore: No further questions.

(Discussion regarding length of case and number of witnesses to be called.)

(Thereupon an adjournment was taken until Wednesday, September 20, 1944, at 10:00 a.m.)

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Wednesday, September 20, 1944,  
10:00 O'Clock A.M.

Mr. Moore: Call Mr. Lohse.

FRED LOHSE,

called as a witness by defendant; sworn.

The Clerk: Will you state your name?

A. Fred Lohse.

Direct Examination

Mr. Moore: Q. Mr. Lohse, what business are you engaged in at the present time?

(Testimony of Fred Lohse.)

A. I am a chemical engineer on the staff of Harry J. Kaiser, special service division.

Q. Will you explain what the special service division is?

A. The special division at the present time is composed of a number of engineers and others who are engaged in analyzing the various problems of production and marketing, and generally looking after the technical aspects of the activities of the company at this time.

Q. Does that include looking to the development of new products and new uses?

A. Yes, sir, it does, of the various enterprises that are managed by the company.

Q. How long have you been connected with the Henry J. Kaiser Company?

A. I joined the staff of Permanente Cement Company in 1939 as an industrial engineer; then in 1940 I joined the staff of the then newly-created Permanente Metals Company as raw materials engineer. I continued in that capacity for two [399] and a half years, until the fall of 1942, when I became assistant manager of the development and engineering division of the Henry J. Kaiser Company.

Q. In the construction of the Natividad, Moss Landing and Permanente plants, did you have any participation in that?

A. Yes, the research work that was necessary to adapt the raw material from the Natividad

(Testimony of Fred Lohse.)

quarry to a working process involving the use of sea water to make MgO was under my direction.

Q. And in the construction and building of those plants you conducted experiments of various kinds and research work in regard to that, did you?

A. That is right. And then shortly afterwards I became project engineer for the Moss Landing plant, and about one-third of the way through the construction of that plant I became construction superintendent also.

Q. Let me ask you, has the dolomite deposit in Natividad any peculiar qualities that make it particularly available for use? A. Yes.

Mr. Naus: I didn't catch that question.

(The reporter read the question.)

A. Yes, it does. We surveyed several deposits in the general vicinity, tested them in our Moss Landing pilot plant, which we had set up at Permanente, and arrived at the conclusion that the Natividad material was by far the best material for use at a sea water magnesia plant.

Q. Can you explain what particular qualities had that were [400] superior to the others?

A. First of all—

Mr. Naus: For that purpose?

Mr. Moore: For that purpose, surely.

A. First of all, the chemical analysis is excellent as compared with most dolomites found in California, and in this district in particular. Secondly, we became convinced, upon conducting our pilot plant work, that the rock has a peculiar physi-

(Testimony of Fred Lohse.)

cal characteristic that makes it especially adaptable to a simple effective treatment with sea water to form a very high grade MgO, or magnesium oxide.

Q. This particular process requires the use of sea water, does it? A. Yes, it does.

Q. Do you know whether or not there are any other plants of similar character in this country?

A. Yes, there is one that I am somewhat familiar with at Cape May, New Jersey, that uses lime instead of dolomite. There is one at South San Francisco that uses lime instead of dolomite. The plant of the California Chemical Company, at Newark, uses both lime and dolomite to react with bittern to form MgO.

Q. Is the process at Permanente distinctive from the type of installation used at these other plants?

A. The Permanente Metals manufacturing process, you mean?

Q. Yes.

A. Yes, it is. It is the only carbo-thermic plant in the United States. It requires a very high grade magnesium oxide as the feed from which to reduce the metal magnesium. [401]

Q. Are there any other carbo-thermic plants in the world, do you know?

A. Before the war Dr. Hansberg had installed in Konan, Korea, a plant that is probably running. There was a small plant in Rodhind, Austria, that is probably running. There is a small plant at Swansea, England, that we don't know whether it is running or not.

(Testimony of Fred Lohse.)

Q. Are the physical characteristics of this dolomite and the sea water at Moss Landing peculiarly adapted to this carbothermic process?

A. Yes; we spent considerable effort in developing a process at Moss Landing that would produce a particularly high grade MgO, which in turn would produce a particularly workable process at Permanente. The presence of impurities such as iron and silica and boron are particularly harmful in the carbo-thermic process.

Q. Now, in the research that was made prior to the installation of these plants, was any of this dolomite calcined?

A. Yes, we shipped approximately five tons of crushed dolomite from the Sterling quarry at Natividad,—the Sterling quarry, incidentally, is adjacent to the present Permanente quarry, and is the same deposit of rock,—to the University of California at Berkeley, where the 5 tons were calcined in a small rotary kiln about 18 inches in diameter and 30 feet long. The material was put in airtight drums and then shipped to the Permanente Metals laboratory, where we conducted the experimental work, using the dolomite and the sea water to produce [402] high grade MgO. And on the basis of that experimental work we designed the Moss Landing plant.

Q. Are you familiar with the designing of the Natividad plant?

A. Yes, I am generally familiar with the design of that plant.

(Testimony of Fred Lohse.)

Q. And in this calcining was there any data secured that you referred to?

A. Well, the first information that would be obtained in any calcining plant would be the tendency for a trial feed material to break down in the kiln. In the small rotary kiln at Berkeley, or any small rotary kiln, the material would not behave in the same manner as it does in a larger, longer rotary kiln, for obvious reasons: In the long kiln the material will be ground through attrition as it rolls through the kiln and the heat gradient in the kiln would be different.

The Court: Spell it.

A. G-r-a-d-i-e-n-t. It means the rate at which heat increases as you go through the kiln. So that we got data regarding the amount of fines in the product from the small kiln when we conducted the work at Berkeley as a part of the whole information that we tried to develop there.

Mr. Moore: Q. Now, do you know whether or not the original plans for the Natividad plant made any provision for a Cottrell?

A. Yes, the modern practice—modern engineering practice usually brings the attention of the engineers to the question of waste disposal, and in the original lay-outs that were made for the Natividad plant, as well as the Moss Landing plant, there was provision for a precipitator of some kind. [403]

Q. From your experimental work, research work, with reference to the Natividad plant, was it possible to design a precipitator or a Cottrell?

(Testimony of Fred Lohse.)

A. No; in the case of the Natividad plant, provision was left in the ground—in the lay-out, for a Cottrell, but the Cottrell was not installed originally, primarily for the reason that in feeding a rotary kiln with a dry material, it is impossible to tell ahead of time what the percentage of reduction, both due to attrition and due to the effect of the thermal gradient on the material, will be. The experiments at Berkeley indicated a very small breakdown of the particle size of the feed in the rotary; but in general practice it is known that you cannot take the results from a very small kiln and translate those into what you might get from a large kiln.

Q. Then do I understand you that, from these experiments that were had, it was impossible at that time to design the precipitator? Is that correct?

A. That is right. It would be extremely hazardous to attempt to design a Cottrell that would have the proper capacity to take out the fines on a dry kiln operation. It would be necessary, and I believe is usually the practice, to get operating data from your actual full scale operation before you can design—before you have the facts needed to design a precipitator that will take out the fines.

Q. In other words, if I understand you correctly, these precipitators are designed for each particular problem, is that [404] correct?

A. That is right.

Q. I mean, they are not standard, at all?

(Testimony of Fred Lohse.)

A. No, a precipitator must be designed for the particular job. If there happens to be technological information available from other purposes that are virtually duplicates of what you are doing, it is sometimes possible to borrow that information, but usually not.

Q. Now, do you know when the Natividad plant commenced operation?

A. I believe the Natividad plant began operating in about August of the year 1942. I am not certain of the exact date, because I was not directly connected with the operation of the plant.

Q. Were you connected with the actual study of the Cottrell at Natividad?

A. No, sir, I was not.

Q. You don't know when those studies commenced or when the installation took place?

A. No, I was busy with the other plant at that time.

Q. Now, in the position that you occupy, part of your duties are the study and the application that can be made of the products of this plant, is that correct? A. Yes, it is.

Q. And you are familiar with that?

A. Yes, quite, in that since between January and August of this year I was assistant manager of the Firelands Division of Permanente Metals Corporation at Marion, Ohio. There we loaded many thousands of the so-called goop bombs which have been developed by the War Department. They are a 500-pound incendiary bomb made from the

(Testimony of Fred Lohse.)

[405] unique dust or finely-divided magnesium that is produced at the Permanente plant at Permanente; that is, it is crude magnesium metal.

The Court: Q. Crude magnesium metal?

A. Yes, sir.

Q. In a powdered form?

A. Yes. That is the primary production product of the magnesium plant. Then that metal, if—if that crude metal is to be made into metallic magnesium for application to castings, and so on, it is distilled under vacuum and made into the clean solid metal. However, for the use of the incendiary bomb, we had an extremely highly-divided material which is extremely active chemically and burns very fiercely, so that it was not necessary to take metallic magnesium and grind it mechanically and put it into a bomb which would then ignite and burn the metal. It is really a shortcut, but it is better than a shortcut, because of its special chemical property, since it is so finely-divided.

Mr. Moore: Q. Is that the only plant in this country that produced that particular product?

A. Yes, it is.

Q. And that is used in the war effort at the present time, is that correct?

A. Yes, all of the production of the Permanente plant, except a very small amount for certain experimental purposes, has been going into the production of what we call goop, which is used—which is the crude metal used in incendiary bombs and in other incendiary applications.

(Testimony of Fred Lohse.)

Q. You referred to metallic magnesium as distinguished from [406] the crude metal. Has metallic magnesium been manufactured at this plant?

A. Oh, yes, there have been many millions of pounds of metallic magnesium manufactured.

Mr. Naus: You mean in ingots, Mr. Moore?

Mr. Moore: In ingots.

A. Yes.

Q. What use has that been put to?

A. Well, that has gone entirely into the war effort, in making castings and incendiary materials of various kinds. We don't know—the company doesn't know where the metal has been used, largely because most of the uses have been under the strict supervision of the War Department.

Q. Now, is there a magnesium oxide from Moss Landing that is used in the war effort?

A. Yes, part of the production from the Moss Landing plant is used as a base material for making catalysts for the cracking of high octane gasoline; that is, the oxide is coated with a metal salt; the metal is reduced from the salt or the oxide and makes a special catalyst.

Then, in addition, Permanente has been manufacturing its own high temperature refractories at a small plant at Milpitas for use in the cement kilns. It has been very difficult during the war to get suitable refractories for those big rotary kilns, and it has been necessary for us to develop our own.

Also, we are working with the Anaconda Copper Company, who have large rotary kilns at Butte,

(Testimony of Fred Lohse.)

Montana, in the copper roasting work that is going on there, and we are producing for [407] them experimental lots of brick to be used by Anaconda Copper.

We are also making some special high temperature refractories that will find various uses in electric furnace practice, and we are making high temperature refractories for the Fontana Steel plant. That is a very definite part of the program for utilizing fully the product from Moss Landing in the West, here.

The Court: Q. To withstand heat?

A. Yes. Magnesium oxide is, in effect, burned magnesium metal, and that has a very high melting point and will withstand high temperatures. The brick made from magnesium oxide then is used as a lining for steel shells in cement kilns, copper roasting kilns, and electric furnaces used for smelting ores and metals.

Q. They use it in the clay process in these furnaces?

A. Yes, it is used as a brick lining for the furnace and then the materials are placed inside the furnace and smelted. I might add that in the past, magnesium has been——

Mr. Moore: Pardon me just a moment. We have not used the term "magnesia." Is there another name for it?

A. Magnesium oxide. I should stick to that, because it is confusing, since magnesium is very much the same. Magnesium oxide in the past has been

(Testimony of Fred Lohse.)

available on the West Coast in brick form only from Eastern manufacturing plants. The usual practice has been to ship the calcined magnesite or magnesium oxide from Tukwila, Washington, to plants at Baltimore and Cleveland to make the brick, and then ship them clear back here to the Pacific [408] Coast. That has made the user of bricks pay a premium on the Pacific Coast whenever high temperature brick is used here. We fully intend to reduce the cost of high grade refractories on the Pacific Coast by using our own Western magnesium oxide and manufacturing the brick here.

There has been a great increase of technological applications for high temperature refractories as a result of the war. Many rotary kilns have been installed, many furnace processes have been installed, and it is the intention of the company to service all those processes through the manufacture of special high grade bricks.

Mr. Moore: Q. That particularly applies to the West Coast, here, I take it?

A. Yes; the war effort has increased the need for high grade refractories here and it will now pay and be desirable to all concerned to have their source of that material on the Coast.

Q. And when we talk about an industrial west, is that an important element in it?

A. We think it is.

Q. In your opinion? A. We think it is.

Q. Coming back to the magnesium oxide, again, is any of that at present being shipped to the British?

(Testimony of Fred Lohse.)

A. Yes, the magnesium oxide—part of the magnesium oxide production from Moss Landing has been shipped directly to England, where it is used in the English carbo-thermic plant.

I might add that at Swansea, England, there is a sea water [409] magnesium oxide plant that uses dolomite and sea water, and that plant has been a great disappointment to the British. We think it is because of the fact that we have a freak dolomite at Natividad which gives a high grade magnesium oxide with sea water, it has been impossible for others to do the same job with dolomite.

Q. Now, in regard to another war use, are any of the by-products here used in making a cement that is spark-proof, or a covering used—

A. Yes; one of the uses for magnesium oxide is to fuse the material in an electric arc, and to make very effective high-tension insulation material; that has been used extensively in the new installations where it has been necessary to transmit power over long distances at very high voltages.

Q. I don't think you understood my question, but the answer can stand. I understood that some way or other it was used in giving a spark-proof covering or something of that sort in warships and battleships.

A. Well, yes, that is another application of magnesia. Magnesium oxide calcined not as completely as a magnesium oxide that is used in a magnesium plant will, when mixed with magnesium

(Testimony of Fred Lohse.)

chloride solution, set into a very hard cement that is called magnesium oxi-chloride cement. That cement has been used as a lightweight, fire-proof deck material on warships, on passenger liners, on tops of counters where there is a great deal of abrasion, and in many other uses where a special material was necessary. In the past, the use [410] of the magnesium oxi-chloride cement has been rather limited by the fact that it has been very difficult to get a high grade and white magnesium oxide. The war effort has resulted in the building of plants in the United States which can now produce magnesium oxide at prices far below the milk of magnesia type plant that existed before the war, where it was necessary to operate a small plant at a high cost and get a high price for the material. So that we anticipate that after the war great quantities of magnesia will be used as an oxi-chloride cement. We know the market exists. The only thing necessary is to get the price down where it is now—or has been necessary to get the price down where it is now, and to make the material available.

Q. You mentioned high octane gas. Are any of the by-products of this plant used in the manufacture of high octane gas?

Mr. Naus: Hasn't he already mentioned it as a catalyst for that?

Mr. Moore: I think he has. All right, I will pass that.

Q. Has it any use in the manufacture of synthetic rubber?

(Testimony of Fred Lohse.)

A. Yes; another grade of magnesia that can readily be produced—in fact, is produced at the Moss Landing plant part of the time, by merely changing the temperature at which the kiln is operated, is called extra light magnesia. That material is used as a filler in the compounding of synthetic rubber. Great quantities of that are being used now by the manufacturers of [411] rubber articles from synthetic rubber.

Q. Have you mentioned periclase used in insulating materials—its use in that connection?

A. No, I have not. Periclase is another product that is made at Moss Landing by adding a slight amount of silica to the kiln feed. The silica forms a magnesium silicate, which tends to fuse slightly or clinker and shrink to a dense translucent product which is used in high refractory bricks, is used in insulating materials and is finding a great many uses now as an abrasive.

Q. Just what do you mean by an abrasive?

A. An abrasive is—

Mr. Naus: Everybody knows what an abrasive is.

Mr. Moore: It has many definitions.

A. An abrasive is any material that is hard and can be used as a grinding medium, such as in grinding wheels, and sand blasting, and so on.

Q. Is there any particular present work other than shipping this to the British Government—any present work going on there in connection with some work desired by the British Government?

(Testimony of Fred Lohse.)

A. Yes. At the present time samples of goop are on their way to England, and considerable work has been done developing a new incendiary product for the British War Department. They have taken the experience that the American War Department has gained through the use of the goop bomb or incendiary bomb and are now applying it in an entirely different manner for low-level bombing and strafing purposes with surprisingly encouraging [412] results. And at this time here is a considerable shipment of goop on the way to England, and three of our engineers also are about to leave to put the material through a complete testing in England for use as a combat material.

Q. Has the product any use in welding?

A. Yes, magnesium oxide is used as a coking for welding rods where it acts as a flux and oxide inhibitor.

Q. Do you know whether it has any use or not in the manufacture of rayon?

A. Yes. One of the extra light grades of magnesia is used as a filler for the spinning of rayon.

Mr. Moore: I don't know whether I have covered all the uses.

Mr. Naus: I don't think anyone could; I think it is going to revolutionize commerce in metal. I don't think Mr. Lohse or anyone can dream of the possibilities of it. He couldn't state them all. He can only state all those that he has thought of so far. I think there will be many uses not dreamed of right now. I think he will agree with me.

(Testimony of Fred Lohse.)

The Witness: Of course, we are discussing primarily the uses of magnesium oxide rather than metal.

Mr. Moore: I will accept Mr. Naus' statement.

Mr. Naus: If you would like to have me make it broader, I will, but I don't know how.

Mr. Moore: That is all right.

Q. Mr. Lohse, are there any other plants on the West Coast [413] that can produce these materials?

A. Yes, there are two others that I know of. One is a small plant at South San Francisco that has been producing pharmaceutical grade magnesia—or magnesium oxide, I should say. The other is the California Chemical Company of Newark, California, which produces various grades of magnesium oxide. Incidentally, part of the production from the Moss Landing plant is sold to the California Chemical Company to supply their demand, which is greater than their plant can supply.

Q. Do you know what the cost of production and sale of the product at Permanente is as compared with other magnesium plants, not only in California, but throughout the country?

A. Of the metal, you mean?

Q. Yes, of the metal and the various by-products.

A. Well, we know that our production cost of the oxide at Moss Landing is lower than anything accomplished on the West Coast, and probably in the United States. The production cost of magnesium metal at Permanente is now down to where

(Testimony of Fred Lohse.)

the plant is operating in the black rather than in the red.

Q. How does that compare with the cost of it at other plants in the country, do you know?

A. I believe that it is probably competitive with most other plants in the country; especially we know that it is competitive with Western plants. It might not be competitive now with one or two of the Eastern plants that have been in operation for a long time. [414]

Q. And there are various efforts being made, I take it, to constantly cut the cost of production, is that correct?

A. There is every possible effort being made to do that.

Q. Are you familiar with the cost of this installation—the Permanente installation?

A. Well, the Permanente Metals plant originally cost about \$21,000,000.

Q. That is the one located where?

A. It is at Permanente; that is a metal reduction plant.

Q. What did the one for Moss Landing cost?

A. That plant cost \$2,200,000.

Q. What did the Natividad plant cost?

A. That one cost just \$2,000,000.

Q. In other words, in round figures, approximately \$25,000,000 for the three plants?

A. Yes.

Q. Can you tell how many people are employed directly in all these three plants?

(Testimony of Fred Lohse.)

A. Yes, I have a note on that as of September 7th. At Natividad there are 69 on the payroll. At Moss Landing there are 79. At Permanente Metals at Permanente there are 795. And at the brick plant at Milpitas there are 20. That gives a total of 963.

Q. Those are directly employed, is that correct?

A. Those are employed in the operation of those four plants.

Q. Turning to the quality of the material produced in this process, how does it compare with the purity of the material produced elsewhere?

A. You mean the magnesium oxide or the [415] magnesium metal?

Q. Magnesium metal and magnesium oxide.

A. Well, both of them—both the magnesium oxide and the metal from the magnesium oxide are extraordinarily pure.

Q. Do you know of any other as pure on the Pacific Coast?

A. Yes, the products made—the product made at South San Francisco is as pure; but it is a very small plant; it makes pharmaceuticals.

Q. It makes no metal at all, does it?

A. No. In fact, it makes only milk of magnesia for pharmaceutical purposes. Then the plant at Newark produces some material that is as pure, but only a small part of their total production is as high grade magnesia as the Moss Landing product.

Q. Does it produce any metallic magnesium?

A. No, it does not.

(Testimony of Fred Lohse.)

Q. This is the only plant of those which are located here that produces the metallic magnesium, is that correct? A. That is right.

Mr. Moore: That is all. [416]

Cross-Examination

Mr. Naus: Q. By the way, Mr. Lohse, is the Natividad calcining plant in actual operation at the moment, or is it shut down?

A. I don't know, sir.

Q. You don't know whether it has been in operation or shut down the last few days, do you?

A. No, sir, I do not.

Q. I see. Thank you. Now, as I understand, any element of uniqueness in the situation—element or elements of uniqueness in the situation at Natividad arise, No. 1, from the quality of the dolomite ore? A. That is right.

Q. And, No. 2, from the end product down at Permanente being such minutely divided particles of oxide, is that it, or dust—metallic dust?

A. Yes. Those are two unique situations.

Q. I am trying to find all the elements of uniqueness of the operation down at Natividad, Moss Landing, and Permanente that set them apart from other operations that might be called similar or competitive operations. Have I named all the items of uniqueness?

A. Those are the two main ones, I would say.

Q. Is there any minor element of uniqueness?

(Testimony of Fred Lohse.)

A. Another one is the fact that we are able to produce on a large scale magnesium oxide at a low cost which is now needed for catalysts and other things. We are supplementing the supply on the Pacific Coast that is met by— [417]

Q. That simply relates to the dollar or commercial position of the plants as distinguished from chemistry or metallurgy, I take it?

A. Well, primarily, yes, except that there wouldn't be any other place to get the material that is needed but from Moss Landing.

Q. But that element could be duplicated at some time in peacetime elsewhere, couldn't it—that size of plant or low cost?

A. I don't—I don't know where it might be done.

Q. I see. I will pass that, then, for the moment. Now, as to the uniqueness of the ore—we have in evidence here—it has been marked by the Court as Plaintiffs' Exhibit 2—an airplane view, one of the common airplane views taken around the country, that shows the plant, quarries, and the like. Can you identify that? We are in agreement that that is a true airplane view.

A. That is right.

Q. There are two quarries depicted on it. One says "Bethlehem Quarry," and the other one says "Quarry Area." Do those two quarry areas depict the whole of the quarry areas connected with the operation at Natividad?

A. Yes, they do. As far as I know, they do.

(Testimony of Fred Lohse.)

Q. You spoke in your direct testimony about the Sterling quarry. Is that depicted on that photograph?

A. Well, the Sterling quarry is another name for the Bethlehem quarry, because it is on the Sterling ranch. We always referred to it that way.

Q. Now, what is the extent, so far as you know or can say, of [418] that deposit of dolomite?

A. Well, we have drilled and blocked out 15 million tons of ore. There is probably a good deal more there.

Q. Well, you have blocked out that much? Will you answer Yes or No so the reporter could catch it. You just nodded. A. Yes, sir.

Q. The rate of consumption of ore in tons is running about what per year?

A. I couldn't answer that offhand, sir. I can't answer that offhand, because—

Q. Somewhere from 100,000 to 150,000 tons a year, would you say?

A. Let me see. I believe the production of the plant is something like 150 tons of calcined material a day.

Q. You would multiply that by 2—1.8—to get the ore?

A. You would multiply it by 2 to get the ore. That is 300 tons a day.

Q. Then that will quickly tell us. That would be somewhere around 120,000 tons a year at the present rate; say roughly 10,000 tons a month?

A. Yes, I would say that is a good round figure.

(Testimony of Fred Lohse.)

Q. When you say "blocked out ore," you mean positive ore in sight?

A. Yes, sir, that has been drilled.

Q. And when you get beyond that 15 million tons of positive ore in sight, tell me what probable ore you estimate beyond that.

A. I wouldn't want to do that. It might be as much again or several times as much again. It is very hard to say. [419]

Q. I think that is correct. Would you indicate as best you can the boundary limits of that deposit on the surface of the ground.

A. As I remember the general layout, it would run substantially back from the present westerly edge of the quarry where the crusher plant is located to the crest of the mountain and over an area perhaps 1,500 or 2000 feet long.

Q. Is it all located on the ground at present controlled by lease or otherwise by Permanente Metals Corporation there?

A. All of the proved ore is.

Q. All of the which?

A. All of the proved ore.

Q. All of the blocked-out ore? A. Yes.

Q. Now, laying aside for the moment the question of cost and the like, laying aside the question of dollars, and speaking directly in terms of ore, chemistry, metallurgy, and the like, upon the quarrying out of that ore at Natividad, it could be hauled miles away and calcined equally well, couldn't it?

A. Yes.

(Testimony of Fred Lohse.)

Q. In other words, all of this enormous \$25,000,-000 operation that Mr. Moore has been pointing your attention to could carry on equally well without the presence of the calcining plant at Natividad?

Mr. Moore: Do you mean from the chemical standpoint or from the dollars-and-cents standpoint, Mr. Naus?

Mr. Naus: I will take it both ways.

Q. From a chemical and manufacturing standpoint, and laying [420] aside the question of dollars at the moment, Mr. Lohse, the ore when quarried at Natividad could be transported miles—hundreds of miles or a thousand miles away—and calcined equally well, couldn't it? A. Yes, sir.

Q. So that the presence of the calcining plant at Natividad is a matter of cost or dollars, is it, merely, or convenience, or what, in this whole operation?

A. The presence of the calcining plant at Natividad has several reasons. May I review those from the beginning?

Q. You have a right to.

A. To begin with, it was contemplated when the plant was first—the plant site was first—or the rock was first drilled for testing, that another magnesium plant, the so-called Manteca silica thermic plant, would be located immediately down the hill from the present quarry to supply silica thermic magnesium. That plant was eventually put at Manteca because of the gas supply at Manteca and because of the War Department insisting on spread-

(Testimony of Fred Lohse.)

ing the plants out. So that by the time the War Department had decided that the plant that became the Manteca plant should not be located near this quarry, the orders had been placed and the ground was being prepared to put this burning plant at its present site. Also, the presence of the plant there was a logical spot for supplying the Moss Landing magnesia plant.

Q. Why?

A. Well, you will have to get back to dollars and cents on that question. [421]

Q. All right; give me any reason.

A. It is better to haul half the weight of material from Natividad to Moss Landing than otherwise would be necessary.

Q. Have you now told the entire reason for the superiority of Natividad over Moss Landing for the purpose of a calcining plant?

A. Those are the principal ones that I can recall. There might be others.

Q. When you say "those," so far as my listening, attentive as I can make it, has followed you, you have given only one; that is to say, the cost of hauling the materials. Have you given any other to give the superiority of Natividad over Moss Landing for the calcining plant?

A. I don't recall now whether we are still considering the thing only from a purely technological basis or from the basis of the reasons that were given for selecting this plant.

(Testimony of Fred Lohse.)

Q. When you get into the question of haul, you necessarily are not getting into chemistry; you are getting into dollars. Now, have you given anything else as a reason of the superiority of the Moss Landing over Natividad for the calcining plant of this particular dolomite?

A. Do you mean the superiority of Natividad over Moss Landing for the location?

Q. Yes, I should have put it that way. That is my error. Is there any other?

A. Well, I might say that if the plant had been placed at Moss Landing there would certainly be no technological advantage. [422]

Q. Or disadvantage?

A. Or disadvantage.

Q. Correct. So it reduces, then, does it not, to the mere matter of its costing 1.8 times as much to haul the crude ore, the quarried ore, as it would to haul the calcined dolomite?

A. That perhaps is substantially the case. However, if there are any questions of disposal of waste or other technological problems that arise, they would certainly be as severe at Moss Landing as anywhere else.

Q. Why? Moss Landing is near the marsh and water for the dust to fall into—your dust disposal—instead of falling into orchards.

A. I believe there is considerable agricultural activity around Moss Landing.

Q. Well, down at Moss Landing, isn't there an area there where you could have a calcining plant

(Testimony of Fred Lohse.)

out near the salt water and marsh land and waste land and the like, or do you know?

A. There is. There is perhaps more area around there. However, we had to consider the problem of our stack gases and dusts at Moss Landing as well as at Natividad.

Q. Now, if the dolomite were calcined at Moss Landing in a plant there instead of at Natividad, would not the calcined dolomite be delivered in your plant at Moss Landing in better shape than it would be if transported 18 miles through the air in open truck from Natividad?

A. No, it would not, because the material is now transported in a specially built sealed truck. There is no detectable deterioration of any kind in [423] the handling.

Q. How long have your materials been hauled from Natividad in a specially sealed truck? Over what period of time?

A. As far as I know, right from the beginning.

Q. Have they ever been hauled in an open truck—that is, open-topped?

A. I am quite certain that they have never been hauled to Moss Landing in an open truck.

Q. I mean from Natividad.

A. That is right.

Q. Have they ever been hauled in an open truck that has a fabric or textile covering over the top merely instead of sealing in the strict sense?

A. I wouldn't know that, sir.

(Testimony of Fred Lohse.)

Q. Well, then, since it would appear that the superiority of Natividad for the location of the calcining plant gets down to a need of hauling only one ton of calcined dolomite as against 1 4/5 tons of crude dolomite, what does that cost amount to in dollars?

Mr. Moore: That isn't the testimony at all.

Mr. Naus: Well—

Mr. Moore: Pardon me, Mr. Naus.

Mr. Naus: Make an objection, please, because the witness agreed with me. He nodded "Yes." And I don't think you follow the witness, if you haven't followed him to that extent.

The Court: Q. So I may follow you, is it a fair statement to limit it to twice the cost?

A. I beg your pardon?

Q. Is it a fair statement to say that in this hauling, and [424] limiting it to the hauling process, is it double the cost to take it to Moss Landing?

A. Yes, because we have to haul twice the weight to get the same amount of solid.

The Court: All right.

Mr. Naus: Q. How many employees in the total payroll you speak of are engaged in the calcining plant, in that operation at Natividad as distinguished from the quarry operation and the hauling operation?

A. All I have is the total figure of 69 employees on the Natividad payroll. I don't know what the distribution is.

Q. Wouldn't those employees, generally speak-

(Testimony of Fred Lohse.)

ing, be divided between employees at the quarry, employees in the operation of the calcining plant, and employees engaged in hauling dolomite ore?

A. Yes, they would.

Q. I am trying to find as best you can estimate the number connected with the calcining plant itself as distinguished from the other operations there.

A. I haven't followed the details there; I wouldn't want to make a guess. We could get the information exactly, but I wouldn't want to make a guess on it. It might be a third or it might be more.

Q. By the way, what is the height of the stacks of the kilns, the stacks from which the dust escapes at the top of that calcining plant?

A. At Natividad?

Q. Yes. A. I don't know that.

Q. You spoke of participating in the design of the plant. In [425] the design of such a plant what determines the height of the stack?

A. First of all, may I say that I participated in the design of the Moss Landing plant; I was project engineer on that.

Q. Did you participate in the design of the Natividad calcining plant? A. No, sir.

Mr. Naus: That is all.

#### Redirect Examination

Mr. Moore: Q. Mr. Lohse, near the Moss Landing plant you have farms and agricultural pursuits in its vicinity, do you?

(Testimony of Fred Lohse.)

A. Yes. The entire area east of the Moss Landing plant is devoted to farming, cattle grazing, and to the east and south there is artichokes.

Q. Did you have a dust problem there, too?

A. At Moss Landing?

Q. Yes.

A. Well, at Moss Landing we were able to design and install immediately a Cottrell precipitator that has done an excellent job.

Q. There is a Cottrell precipitator there at the Moss Landing plant and that was installed at the time the plant was built? A. That is right.

Q. It was possible to design that prior to the construction of the plant?

A. Well, yes, in that case it was quite possible to design a Cottrell plant that would do a good job for the reason that we knew exactly what the particle size of the [426] material going to the kiln would be, and it was in the form of a wet slurry or mud.

Q. Wet what?

A. Wet slurry or mud. Then as this material proceeds through the kiln it is first dried, then works its way on down the kiln, where eventually it is calcined—goes through the chemical reaction of calcining and is discharged from the kiln. With that type of feed, the engineering data on the amount of feed, the rate of rotation of the kiln, and the amount of air going through the kiln would give you exactly the amount of solid that you would expect in your flue gas. Then knowing that,

(Testimony of Fred Lohse.)

it was a simple matter to design a Cottrell that would be effective and would do a good job—which was the case there.

Q. In other words, you had the agricultural pursuits in the neighborhood of Moss Landing the same as at Natividad, and you had placed a Cottrell there and you had the same problems to meet, is that correct?

A. Well, we anticipated the same problems at both plants. At Moss Landing we were able to meet the problem, because we had enough design data to go ahead with the Cottrell precipitator.

The Court: Q. Were they both built at approximately the same time?

A. Yes, they were both—building was started on both plants simultaneously. We knew that the prevailing wind was east and from the southwest, so that we felt that we could take precautions there to keep the dust from [427] blanketing pastures and areas in that area.

Mr. Moore: Q. In other words, if the calcining plant had been built at Moss Landing exactly the same problems would have existed as existed at Natividad; is that correct?

A. That is correct, yes.

Q. In other words, the only result of building the plant at Moss Landing would be the cost of hauling would be double, but the same problems would be presented in both places, is that correct?

A. The same technological problems would exist, yes.

(Testimony of Fred Lohse.)

Q. You made a statement I wasn't aware of, but at any rate, it may cause some other testimony. You say that from the beginning they used specially constructed sealed trucks. And that has come within your personal observation and knowledge, I take it? A. That is right.

Q. Having been at Moss Landing?

A. That is right.

Q. You have seen the trucks and know them?

A. Yes.

Q. And to the best of your knowledge and information, all the product that has been hauled from Natividad to Moss Landing has been hauled in these sealed trucks?

A. That is right. It is very necessary, especially during the rainy season, it wouldn't do to get it wet.

Q. In talking about building, do you know whether the materials could be gotten at this time to build another calcining plant?

A. If it became necessary to build a calcining plant at Moss [428] Landing now, you mean?

Q. Yes.

A. I am rather doubtful that it is possible to get the materials to build such a plant.

Q. They are subject to priorities, are they?

A. Yes.

The Court: Is that all from this witness?

Mr. Moore: That is all.

Mr. Naus: You have finished with him?

Mr. Moore: Yes.

(Testimony of Fred Lohse.)

Recross Examination

Mr. Naus: Q. Is there anything other than pasture land within a radius of a couple of miles of the plant at Moss Landing?

A. Not that I know of, sir. I think that the artichoke fields are at least that far away—a mile and a half or two.

Q. So that any crops or any culture down there are at least more than two miles away from the Moss Landing plant, isn't that correct?

\* A. That is, I think, correct. I am not certain; I believe that is right.

Q. What is the present stack loss at the Moss Landing plant?

A. The stack loss at the Moss Landing plant has been consistently about two percent.

Q. What is that in tons per 24 hours?

A. That is only about a ton, I believe.

Q. Yes. A. That is purely a guess now.

Q. Is it a guess or a rough estimate?

A. I would say it is [429] a rough estimate. I am not sure of it.

Q. What is the present stack loss at Natividad per 24 hours?

A. I don't know. I haven't followed the operation there at all.

Q. Is there any reason why the plant at Natividad could not reduce the stack loss to no more than a ton per 24 hours equally well with the performance at Moss Landing?

(Testimony of Fred Lohse.)

A. Well, there probably is—in fact, I am sure there is this reason for it: It was possible to anticipate, from the character of the feed to the Moss Landing kilns, exactly what the total dust volume would be at Moss Landing and therefore design a Cottrell to fit the case. At Natividad it was necessary to get operating data and then proceed from that to the design of a plant.

I might add that the Western Precipitation Company had never designed a Cottrell system for a dolomite calcining operation, and there were a number of uncertainties in their minds regarding the design of such a precipitator, and it was necessary to get data from the actual operations before they proceeded.

Q. Do you mean to suggest that the precipitator at Natividad is still in an experimental stage?

A. No, I do not. I wouldn't say that it is in the experimental stage, but it was a precipitator designed, as in all other cases, for a certain job. [430]

Q. Could the performance in time be brought down to not more than one or two tons per day of stack loss, would you say, at Natividad?

A. That is probably consistent with practice in many cases, and it is certainly to be expected that that operation can be improved.

Q. When you say consistent with the practice in many cases, what specifically do you have in mind as the cases?

A. Well, for one thing, the Permanente—the precipitator at the Permanente cement plant, the

(Testimony of Fred Lohse.)

precipitator at the Moss Landing plant, and the precipitator that I know of at the Getchell mine in Nevada where arsenate dust is precipitated quite fully from the atmosphere. And of course in all those cases the precipitators were designed on the basis of long years of experience with that type of dust, and each dust is a separate problem. Each operation is a separate problem, and the precipitator has to be designed for that job.

Q. As you sit there now do you know of any reason why the stack loss at Natividad could not be cut down to no more than one ton per 24 hours?

A. Well, frankly, sir, I don't know of any reason or any method by which it could be done effectively. I think that will have to be worked out.

Q. You think it can be worked out, though, don't you?

A. There is every reason to expect that it can be worked out, yes. It has been in other cases where the trend has been toward better and better precipitation consistently. [431]

Q. Do you know of any reason why it can't be worked out so that the stack loss at Natividad from the two stacks in the aggregate should not exceed a half ton of stack loss per 24 hours?

A. Well, of course, that is getting down to—I have a ton in mind.

Q. It is getting down to this case.

A. I had a ton in mind as an example of what might be done.

Q. Yes.

(Testimony of Fred Lohse.)

A. Judging from the general case in other operations, I suppose that if one were to build enough Cottrell precipitators and put them all in series, eventually you could precipitate everything out of every feed that goes to a Cottrell system. But it would be like the steamboat with an eight-foot whistle—blow the whistle and the boat stops; it would cost you more to operate the precipitator than to run the plant. You would get to that point.

(Recess.)

Mr. Naus: Q. Then, as I understand it, Mr. Lohse, by some increase in the capacity of the precipitating system the stack loss can be reduced?

A. I would say by some increase in the effectiveness of it. I am not too well versed on the details of the design of an electrical precipitator. It is questionable whether it could be increased in size. The best approach would be to improve the performance of it, I would guess. I am not too well—

Q. Do you—pardon me. I thought you had finished. [432]

Mr. Moore: What did you say?

The Witness: I am not too well versed on the technological aspects of electrostatic precipitation. That is a special field.

Mr. Naus: Q. Then, as distinguished from an increase in size of the present precipitator, I understand your testimony to be that the multiplication in series, say, having two units instead of the present one, would reduce the stack loss?

(Testimony of Fred Lohse.)

Q. Yes, that is a logical conclusion that would apply in a case of this kind.

Q. And the multiplication would not have to be any more than from one to two, would it, to reduce stack loss?

Mr. Moore: To reduce stack loss to what?

Mr. Naus: I do not know to what. Perhaps zero. Perhaps we will reach that point. Let us find out.

A. Well, sir, I do not know that I could make a quantitative statement on that. I do not know enough about the technological aspects of electrostatic precipitation. The manufacturer's engineers are qualified to answer that. I would not want to guess how much of an addition physically you would have to add to any Cottrell system to increase its capacity or how you go about increasing its efficiency.

Mr. Naus: That is all.

#### Further Redirect Examination

Mr. Moore: Q. Mr. Lohse, Mr. Naus asked you in regard [433] to certain reductions—one ton per day, a half ton. Are you familiar with that process so that you could give any answers on those subjects?

A. Well, I believe I said that it was merely a guess, that you might reduce it to some such figure consistent with ordinary, or, rather, common practice, or good practice. Anybody could make such a guess. Any engineer might make such a guess. But

(Testimony of Fred Lohse.)

that is only based on logic, so far as I am concerned.

Q. You have never constructed a Cottrell?

A. No, sir.

Q. You are not familiar with the technicality of it, are you?

A. No, sir. We simply asked the manufacturer of the Cottrell system to give us what we want based on the data we can furnish, and we were at his mercy.

Q. Do you know whether those measured usually in the volume of dust, that is, the reduction percentage, or whether they figure it in tonnage, or how they figure it? Have you any idea on that?

A. Both are involved, of course. A calculation of the total amount of work the thing has to do is based on the tonnage data that you give the manufacturer of the Cottrell system, and then he will design the Cottrell system so that it will take out a certain percentage of the dust.

Q. Take out a certain percentage?

A. Yes. There again we get back to the question in engineering practice of what is involved in, say, taking a hundred percent of the dust out of the flue gas. A certain installation might take 99.5 [434] percent of the dust out of the flue gas, and then you might have to duplicate the installation to get the other .5 of 1 percent, and that is a problem that is a highly specialized one and is left by us to the manufacturer of the equipment.

Mr. Moore: I think that is all.

Mr. Naus: If the Court please, at this time I would like permission, which is given by Mr. Moore so far as he is able to give it, aside from your Honor, to call Mr. Anderson, a witness, out of order, in rebuttal. He is a neighboring farmer, and he has informed me that he has to get home as early as he can to milk about twenty-two cows, I think he told me. He seemed a little disturbed about it.

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### LEO ANDERSON

called for the plaintiffs in rebuttal; sworn.

The Clerk: Will you state your name.

A. Leo Anderson.

#### Direct Examination

Mr. Naus: Q. It is twenty-two cows you want to rush back and milk, isn't it, Mr. Anderson?

A. Yes, sir.

Q. I think that is the number you gave me.

The Court: Q. Do you milk them yourself?

A. Yes, sir.

The Court: That is what is keeping you young.

Mr. Naus: He told me he had not been in San Francisco for twenty years, and he complains about the subpenas this Court issues, and I think his complaint is sound. The subpoena [435] stated he should come to the Federal Building, and after he got to San Francisco after twenty years he found there were three Federal buildings.

The Court: Q. You have not been here in twenty years?

(Testimony of Leo Anderson.)

A. No, sir.

Q. Have you attempted to make arrangements with somebody else to take care of things?

A. I couldn't do it.

The Court: I know it is hard.

Mr. Naus: Q. Mr. Anderson, I show you a photograph taken from an airplane. It is an air view. We call it Plaintiffs' Exhibit 2 here. It shows your ranch there from the air. Over here, where it says "Plant Area," there is where those two big stacks are. Up here on the hill is the quarry. Down here there is a place enclosed called "Anderson Orchard." You are the Anderson who owns that orchard, aren't you? A. Yes, sir.

Q. How long have you owned that?

A. Since 1917.

Q. You have some of it set out to apricots, haven't you? A. Yes, sir.

Q. How many acres? A. 17 years.

Q. Of those 17 acres there were 10 acres that came into bearing at an earlier time, and 7 acres at a later time, weren't there? A. Yes, sir.

Mr. Moore: What do you mean? What year?

Mr. Naus: I am going to reach that. I am just dividing the 17. [436]

Q. The 7 acres that came into bearing later, when did they come into bearing? What year?

A. 1942 they started to bear commercially.

Q. How long have the other 10 acres been in commercial bearing? A. Since about '30.

Q. 1930? A. Yes, sir.

(Testimony of Leo Anderson.)

Q. Before the year 1943 what was the smallest crop you ever took off of this 10-acre piece over a period of 20 years? A. 37 tons.

Q. That is over a period of 20 years?

A. Yes, sir.

Q. In the year 1943 what was the total crop in tons that you took off the whole 17 acres?

A. 10 tons.

Q. Can you tell me how that 10 tons was divided between the 10 acres and the 7 acres, roughly? A. No, I could not.

Q. Just all in one heap, is that it?

A. Yes, sir.

Q. But, as I understand it, 37 tons was the smallest amount you had ever taken off the original 10 acres in a period of 20 years?

A. Yes, sir.

Q. You live right on that ranch, don't you?

A. Yes, sir.

Q. You have your home right there, your house and other buildings; your family is right there?

A. Yes, sir.

Q. Right there in your front yard or at your house you can see the Permanente plant in operation, can you? A. Yes, sir.

Q. You can see the quarry on the hill; it is right fairly close to you? A. Yes, sir. [437]

Q. Can you see the dust coming up from the quarry and from the stacks? A. Yes, sir.

Mr. Moore: Pardon me. Which do you mean, Mr. Naus?

(Testimony of Leo Anderson.)

Mr. Naus: What?

Mr. Moore: Dust from the quarry and dust from the stacks?

Mr. Naus: I am asking whether as he sits there at his home or is out in his yard he is close enough so that he can visually see dust rising up there at the quarry. I want to know if he is near enough to see it.

Mr. Moore: I do not like to interrupt, but there is no evidence here that I know of that any dust comes from the quarry. It is all from the stacks.

The Court: He says it comes from the quarry.

Mr. Naus: I will put it this way:

Q. Mr. Anderson, as you are there at your home in daylight and you look up at the quarry, can you or not see dust rising at the quarry?

A. Yes, sir.

Q. A big cloud of it or a small one?

A. Well, when they are blasting, it is a big cloud. Just an ordinary operation—unless when they are dumping these trucks—I don't know whether they have changed their system or not—they would cover the whole country with dust as they dumped their trucks.

Q. Can you see a big white cloud of something or other coming out of the top of the stacks from your home? A. Yes, sir.

Q. After these clouds, whatever they are, rise up in the air [438] from the quarry and from the top of the stacks, can you see them traveling

(Testimony of Leo Anderson.)

through the air according to the prevailing direction of the wind at any time?      A. Yes, sir.

Q. Observing them as you do there at your home, in which direction is the prevailing wind? To make it more simple, is it toward the Pista orchard, or is it towards some other direction?

A. It is usually towards the Pista orchard. During the night when there is no wind it is just—

Q. Hanging?      A. Settles.

Q. In the afternoon when the winds are up, then is it or not the fact that the prevailing wind takes that dust directly over in the direction of the Pista orchard?      A. Yes, sir.

Mr. Moore: I do not like to object, your Honor, but it seems to me these questions are highly leading.

The Court: Without question they are.

Mr. Naus: I will put it this way:

Q. Is there any other direction in which the wind carries the dust more than in the direction of the Pista orchard?

A. Sometimes it carries it over the hill, and a draft through the next canyon brings it back down again.

Q. Brings it back down again to where?

A. Down towards Mr. Pista's orchard, down towards the Temente ranch and Mr. Pista.

Q. As this dust travels through the air, has or hasn't any of it traveled over toward or upon your orchard?      A. Yes, sir. [439]

Q. I understand from other evidence in the case, Mr. Anderson, that the 1942 crop of apricots

(Testimony of Leo Anderson.)

was picked before the plant started to operate, is that correct? A. Yes, it was.

Mr. Moore: I do not like to object, but I think he ought to stop asking leading questions and ask the witness a straight question.

Mr. Naus: I do not think there is any controversy about that.

Mr. Moore: I would like to have him testify and not you, Mr. Naus.

The Court: Just for the moment, let us read that last question.

(Question read.)

Mr. Naus: That was purely preliminary. There is no controversy in this case about the 1942 crop.

The Court: Is there?

Mr. Naus: No.

Mr. Moore: I wouldn't say there is any, but I would like to have this witness' testimony, Mr. Naus notwithstanding. I would like to hear what he has to say.

The Court: Let us proceed.

Mr. Naus: Q. State whether or not any dust traveled from this plant, whether you observed any of this dust traveling through the year 1943 over to your orchard. A. Yes, sir.

Q. Now, Mr. Anderson, what do you believe to be the reason for [440] your 17 acres producing no more than 10 tons in the year 1943?

A. I believe a covering of dust on the blossoms killed, you know, the blossom so it would not form fruit.

(Testimony of Leo Anderson.)

Q. In the year 1944, this present year, how many tons of apricots did you harvest from your 17 acres? A. About 200 tons.

Mr. Naus: You may cross-examine.

#### Cross-Examination

Mr. Moore: Q. Mr. Anderson, will you describe this dust that was deposited in 1943 on your 17 acres? I mean its appearance as it was in the air?

A. How it looked as it settled or as it traveled through?

Q. As it traveled through.

A. Well, when there was no wind at all, as it came out of the stack it went into the air and settled like an umbrella all over.

Q. How close are you to the plant?

A. I should judge about 300 yards from the stacks.

Q. 300 yards from the stacks?

A. I have never measured it, but just—

Q. You are in the immediate vicinity there?

A. Yes, sir.

Q. That same condition existed in 1944?

A. Not so bad.

Q. You say not so bad?

A. Since they put in a control or a Cottrell it has improved.

Q. It has improved it? A. Yes, sir.

Q. Can you give us an estimate of the comparison of the amount [441] of dust that came on your place in 1943 with that that came on in 1944? I mean, from merely observing it in the air.

(Testimony of Leo Anderson.)

A. In tons or—

Q. No, just its appearance.

A. Well, it is not as bad; that is all I can say.

Q. Would you say it is 75 per cent as bad, three-quarters as bad? A. Not quite.

Q. You say "Not quite."

A. I would say 25 or 30 percent as bad.

Q. 25 or 30 percent as bad; that would be your estimate? A. Yes, sir.

Q. Have you ever measured in any way the amount of dust that has been deposited on your place? A. No, sir, I have not.

Q. Never made any measurement of any kind. So you have no figures or measurements on which you can base the figure of 25 or 30 percent, is that correct? A. Just a guess.

Q. You had 200 tons in 1944, is that right?

A. Yes, sir.

Q. Did you have a big crop that year?—I mean a big blossoming? A. In 1944?

Q. 1944. A. Yes, sir.

Q. Were your cots set satisfactorily in that orchard? A. In 1944?

Q. Yes. A. Yes, sir.

Q. Did any of them drop off?

A. Very light June fall.

Q. A very light June fall? A. Yes, sir.

Q. You say a light June fall. Isn't it true that in orchards generally over the years that there is a June fall of cots?

(Testimony of Leo Anderson.)

A. We have a June fall pretty near every year.

Q. In other words, that is the nature of the fruit, isn't it? A. Yes, sir.

Q. Aside from this June fall did you have any fall at all of your cots?

A. No, sir, not in 1944.

Q. Did you have to thin out that orchard in 1944? A. Yes, sir.

Q. To any extent? A. Very much.

Q. In other words, the crop that set in 1944 was probably the largest crop you had ever had set; is that right?

A. Well, I have had them set as heavy before, but the trees were smaller.

Q. What?

A. The trees were smaller. They couldn't carry that amount of a crop to be left.

Q. I am speaking now so far as the number of cots on the trees compared to the size of the trees. I am speaking now before you thinned out. Did you ever have a crop that was heavier on the tree regardless of the size of the tree?

A. I believe I have.

Q. Can you tell us what year?

A. Not offhand, no.

Q. Would you say that the crop that set in 1944 was the second largest crop that you ever had set on those trees? A. Yes, sir.

Q. And it was so heavy it had to be thinned out, is that correct? A. Yes, sir. [443]

(Testimony of Leo Anderson.)

Q. How long a blossoming period was there in 1944?

A. I don't remember. I didn't keep track of it, but, you know, average. Probably a couple of weeks.

Q. You stated in response to a question of Mr. Naus that you believe the reason for your 1943 loss of fruit was the dust, is that correct?

A. Yes, sir.

Q. And the dust that was deposited there on your orchard in 1944 was 25 or 30 percent of that which was deposited in 1943, is that correct?

A. Well, just a rough guess. We are getting that much dust this year.

Q. How do you account for the fact that in 1944 you had the second largest crop set that you had ever had since you owned those orchards, if it still had 25 or 30 percent of dust on it? How do you account for that?

A. That other 75 percent would be enough to cover your entire blossom surface.

Q. In other words, you believe that the 25 percent had no injurious effect, is that right?

A. Well, it didn't appear to.

Q. Would it be your view that if it had been a 50 percent dust that that would have affected your crop in 1944?

A. Well, it might have had some effect on them.

Q. But 25 to 30 did not?

A. It didn't seem to.

(Testimony of Leo Anderson.)

Q. It is your opinion, then, that if the dust deposit was between 25 and 30 and 50 percent, it would have had some effect on your crop?

The Witness: Will you repeat that question again? [444]

Mr. Moore: Will you read it, Mr. Reporter.

(Question read.)

The Court: Do you understand the question?

The Witness: I do, sir.

A. Well, it might have.

Mr. Moore: Q. On what do you base that?

A. Well, maybe the 25 percent was not quite enough to really cover your entire pollen of your blossom to kill them.

Q. How does this dust settle on your orchard? Does it come from one side, or how? How does it come?

A. It all depends on the wind. At night it comes right straight down. There is no wind. It comes down like an umbrella.

Q. How does it come in the daytime?

A. With the wind.

Q. So far as your windage is concerned, during what hours of the day does the wind blow?

A. In which direction?

Q. Well, from the plant toward your orchard?

A. If it blows, it blows early in the evening when we get the wind towards our place. In the afternoon it is more towards the Pistas'.

Q. You say early in the evening?

(Testimony of Leo Anderson.)

A. Well, along five or six o'clock there will be a slight breeze coming that way.

Q. Between five and six?

A. And on into the evening.

Q. Well, how long?

A. Oh, sometimes six o'clock, half past, and other nights it will blow up until ten or eleven o'clock.

Q. Does it blow toward your place in the morning? [445] A. Very seldom.

Q. What hours would you say there is a wind which does not blow towards your place?

A. Well, around noon it usually blows the other way. In the evening it comes back.

Q. Let us take from twelve o'clock noon. From twelve o'clock noon which way—to say five o'clock—which way does the wind blow?

A. It is usually a light west wind blowing.

Q. And blows away from your place?

A. From our place, yes.

Q. So from twelve to five there is no deposit of dust on your place, is that right?

A. If there is any wind.

Q. What is that? A. Is there is a wind.

Q. But that is the usual condition there; the wind is away from your place from twelve to five. Then from five to ten or eleven o'clock at night it is towards your place and there is a deposit of dust usually, is that it? A. Yes, sir.

Q. Now, from eleven o'clock on to some hour

(Testimony of Leo Anderson.)

which you may name, what is the condition of the wind or lack of wind?

A. At night?

Q. Well, from eleven o'clock on.

A. Well, there is no wind to speak of, and it just goes into the air.

Q. Up until what time?

A. That is hard to tell. Some days one time, some days another.

Q. I realize the wind is not constant, but I am trying to get a general approximation, Mr. Anderson.

A. There are days when the wind will come up at ten or eleven o'clock, and other days [446] when it will not start until two o'clock.

Q. I am trying to find out what percentage of the day, what portion of the day the wind blows towards your place, what portion blows away from your place, and what portion there is no wind, or it is calm. Can you tell us that?

A. Roughly, yes. From noon on until five, half past four or five o'clock, it will blow from the west.

Q. That is away from your place?

A. Yes, sir. And in the evening as a rule the wind is blowing the other way and brings it towards my place.

Q. Until eleven o'clock at night?

A. Yes, until eleven o'clock, sometimes earlier.

Q. Then from eleven o'clock until—

A. Different seasons of the year.

Q. Let us confine ourselves now to the blossom-

(Testimony of Leo Anderson.)

ing period. Let us take 1944. When did your pink bud period commence in 1944?

A. I think it was in March.

Q. March? A. I don't remember the date.

Q. Early or late?

A. Well, it was a late blossoming season.

Q. Can you give us any idea, March when?

A. I cannot. I didn't keep track of it.

Q. When the buds opened and the blossoms came, can you tell us when the first blossoms came on your ranch in 1944? A. No, sir, I could not.

Q. You say it was not a particularly long blossom period; I believe approximately two weeks?

A. Something like that, yes. [447]

Q. Can you give us an approximation of the dates in 1944 of your blossom period, that two-week blossom period? A. No, I cannot, sir.

Q. There is no way that you can get that information?

A. I could if I had looked at my books to see when I sprayed, but I didn't look.

Q. You haven't your books with you?

A. No, sir.

Q. During the 1944 blossoming period can you tell us how many days the wind blew the dust towards your orchard?

A. No, sir, I couldn't.

Q. Could you give us an approximation?

A. Well, no, sir.

Q. Could you tell us how many days you had

(Testimony of Leo Anderson.)

calm when this dust settled on your orchard in the 1944 blossoming period?

A. I could not, sir.

The Court: The only difficulty about that is, his ranch is only 300 yards away from this stack. When the wind was not blowing at all it was still deposited.

Mr. Moore: I realize that, your Honor. I realize that.

The Court: And I may say in passing we have had some difficulty here in determining the wind. How was it last week?

Mr. Moore: I appreciate your Honor's remark. I want to come back to 1943, because I realize this gentleman's orchard is in a different position; where there is no wind there perhaps could be dust on it, which I do not believe is the case with the Pista orchard. [448]

The Court: I think this witness is doing the very best he can under difficulties.

Mr. Moore: I appreciate it, your Honor.

Q. Turning to the 1943 blossoming period, that was a comparatively early blossoming period, was it not? A. Yes, sir.

Q. And it was a long one, was it not?

A. Yes, sir.

Q. Approximately how long?

A. Well, there was three different sets of blossoms.

Q. Three different sets of blossoms. Can you tell us what kind of weather you had in the first blossoming? Do you recollect?

(Testimony of Leo Anderson.)

A. No, I do not, sir.

Q. Was it rainy and foggy and cold?

A. We had some rain, yes, sir.

Q. Do you remember whether it was foggy?

A. No, I do not.

Q. Now, on that first blossoming, your cots fell off, did they not? A. Yes, sir.

Q. After they were formed? A. Yes, sir.

Q. Did you observe any jacket rot?

A. They never got big enough for a jacket rot.

Q. They never got big enough for a jacket rot?

A. No, sir.

Q. Did you notice any fermentation or rot of any kind? A. In the small cot?

Q. Well, in the blossom or the cot?

A. The cots were really too weak to tell anything about them. They just formed and dropped off.

Q. Was that practically the entire setting of the first blossoming that dropped and fell off?

A. Yes, sir.

Q. Do you know whether that same thing happened on the Pista ranch? A. I do not, sir.

Q. Do you know whether it happened on the Sterling ranch? A. No, I do not.

Q. Do you know whether it happened on the Hill ranch? A. No, sir.

Q. Do you know whether it happened on any other ranch in Monterey County?

A. No, I do not, sir.

Q. Do you know whether or not there was a short crop of apricots in Monterey County in the year 1943? A. There was around Natividad.

(Testimony of Leo Anderson.)

Q. Do you know whether there was throughout the county? A. Some people had a good crop.

Q. Will you please answer the question: Do you know whether or not there was a short crop of apricots in Monterey County in 1943?

A. I do not, no, sir.

Q. Do you know whether or not there was a short crop of apricots in the entire State of California in the year 1943?

A. I believe there was from some reports.

Q. Well, didn't you in Monterey County make inquiry of your neighbors and the agricultural officials of the State of California at Salinas relative to the size of the crop in Monterey County, and relative to the causes of that short crop?

A. I do not know, sir. [450]

Q. You never inquired of anybody, as to whether there was a short crop in Monterey County?

A. Not off-hand. I don't remember whether I did.

Q. You never discussed whether or not there was a short or a long crop, did you? A. No.

Q. Now, on the second blossom on your ranch or orchard, did the little cots drop off again?

A. Yes, sir.

Q. The same as the first one?

A. The same as the first.

Q. Do you know of any other orchard in Monterey County where that same thing occurred?

A. No, I do not—not that I did not go to examine the other orchards, so I wouldn't know.

(Testimony of Leo Anderson.)

Q. Have you consulted Mr. Harrington relative to suing the Permanente Metals Corporation?

A. Yes, sir.

Q. So you are here as an interested witness, are you? A. Yes, sir.

Mr. Naus: I am glad you put it that he consulted Mr. Harrington instead of the other way around, in view of that letter.

Mr. Moore: We did not go into those details, Mr. Naus.

The Court: Q. Did you drive up?

A. Yes.

The Court: Bear in mind there are 22 cows down there.

Mr. Moore: I am afraid I will have to take some time examining this witness this afternoon, particularly in the light of this situation that has developed. I want to examine him quite fully.

The Court: Q. Who is down on the ranch?

A. Just my wife.

Q. No help at all? A. No. [451]

The Court: I am afraid we will have to run during the noon hour. I am a sort of realist. I meet these problems practically. I think it is important that those cows be taken care of. I know if I was down there located where he was and hadn't been to the city in twenty years, I would want to spend a little time here. He has not been here three hours and he wants to go back and milk the cows. Those are situations we have to meet.

Mr. Moore: Q. Mr. Anderson, on the third blossoming what happened?

(Testimony of Leo Anderson.)

A. There was a few on the top limbs, the top branches that stayed—very few.

Q. On the top?

A. Just the outside branches.

Q. And they formed cots?

A. Yes, sir, but very few.

Q. You say your yield there was about ten ton?

A. Yes, sir.

Q. What was the previous short crop that you had on that ranch? A. 37 tons.

Q. When was that? A. '40, I believe.

Q. Do you know whether or not there was a short crop in Monterey County in 1940?

A. I do not, sir.

Q. Do you know that Mr. Pista had a short crop of 119 tons in 1940?

A. I did not know it.

Q. Have you any recollection or memory as to the comparable weather conditions in 1940 and 1943?

A. No, I do not. We had rain off and on; sunshine as a rule.

Q. You have had this orchard since 1917?

A. 1918. [452]

Q. Haven't you studied and been interested in the weather conditions as they apply to the kind of yield you have?

A. We think of that all year but we can't do anything about the weather, so we take it.

Q. Do you mean to tell me as a farmer where you have a short crop you have no recollection of the

(Testimony of Leo Anderson.)

weather that you had in connection with that short crop?

A. It might have something to do with it.

Q. Have you any recollection? A. No, sir.

Q. I have known many farmers; universally, when they have a short crop they have a very clear recollection of the weather, and you have no recollection at all of the particular weather, you had in either 1940 or 1943, is that correct?

A. That is correct.

Q. Do you know what this dust is composed of, what chemicals? Do you know what kind of dust it is? A. Well, I know it is dolomite dust.

Q. Do you know what that is?

A. Calcium.

Q. What is calcium? That is commonly called limestone, isn't it? A. I do not know, sir.

Mr. Naus: There is some of it in the cows' milk, I believe, Mr. Moore.

Mr. Moore: Q. Do you use Bordeaux mixture in spraying your trees? A. Yes, sir.

Q. Do you know what that is composed of?

A. Lime and bluestone. [453]

Q. Isn't calcium lime?

A. A form of it, I suppose.

Q. Do you know the difference?

A. No, sir.

Q. You sprayed that Bordeaux in 1943, did you?

A. Yes, sir.

Q. You do not attribute your short crop to the lime in the Bordeaux, do you? A. No, sir.

(Testimony of Leo Anderson.)

Q. Why, then, do you attribute your short crop in 1943 to the lime in the dolomite?

A. Well, that lime is diluted very much with water as we spray, whereas the dust is not.

Q. How do you know that?

A. From looking at it, I know we put the water in the Bordeaux and bluestone and lime.

Q. In what proportion do you put it in?

A. 8-8-50.

The Court: Q. 50 gallons of water?

A. Yes.

Mr. Moore: Q. 8—

A. 8 of lime, 8 of bluestone, and 50 gallons of water.

Q. 8 what of lime? Pounds?

A. 8 pounds of lime.

Q. Do you know whether that lime that is the Bordeaux mixture is caustic or not?

A. I do not know, sir.

Q. Do you know whether the lime in the dolomite is caustic, or not? A. No, sir.

Q. Where does the lime in the dolomite differ from ordinary road dust?

A. Well, it is a different color, but road dust will ruin your blossom of any plant.

Q. It will? A. Yes, sir.

Q. In other words, if it is road dust it will ruin your blossom? A. Yes, sir. [454]

Q. Why do you say that?

Q. Where did road dust ruin your blossoms?

A. From experience.

Q. Where? A. On the ranch.

(Testimony of Leo Anderson.)

A. On a bean crop.

Q. When? What year?

A. Along about 1935, 1936.

Q. Where did the road dust come from?

A. From my roadway through the field.

Q. And you attribute it to your own roadway?

A. Yes, sir.

Q. And you attributed the loss of your bean crop to this road dust, is that correct?

A. Yes, sir—not the entire crop, but close to the whole.

Q. Let us get into beans. I do not know anything about that. Do they have a fertilization period? A. I suppose so.

Q. What time of the year does that take place?

A. In June, about June, July.

Q. In that particular year were you driving over this road a great deal? A. Yes, sir.

Q. Does a bean have a bloom to it?

A. Yes, sir.

Q. Did those blooms drop off?

A. They did not drop off, but they just didn't form a bean.

Q. How thick was that bean dust?

A. Well, I would probably drive by a couple of times a day going to a beet field.

Q. And you attribute that loss to driving by there a couple of times a day on the beans, is that it? A. Yes, sir.

Q. How long is the pollination period in a bean do you know?

(Testimony of Leo Anderson.)

A. I do not know, sir. [455]

Q. Do you know how long it takes in an apricot?

A. No, sir.

Q. Do you know that the pollinization period in an apricot from the time the pollen lands is not over an hour of two hours?

The Court: In what authority did you read that?

Mr. Moore: I have the authority, your Honor.

The Court: You do not think the witness has that, do you?

Mr. Moore: I am trying to find out how he figures this dust killed these cots.

Q. You know how long that pollinization period is, Mr. Anderson? A. No, sir.

Q. Upon what fact do you make the claim that the dust in 1943 injured your crop?

A. Because it did not cover the entire blossoms, so that it could not pollinize.

Q. You know nothing about a similar condition existing in any other orchard in Monterey County, is that right?

A. I didn't go to find out.

Q. And you do not know what the general condition with apricots in Monterey County was in 1943?

A. I know it was short around our part of the country.

Q. Do you know where the Bardin ranch is?

A. Yes, sir.

Q. Is that affected by dust? A. No, sir.

(Testimony of Leo Anderson.)

Q. Do you know that they on their first setting lost all their cots? A. I never knew that, sir.

Q. How far is the Bardin ranch from your place? A. I should judge 12 or 15 miles.

Q. What is the closest orchard to your place?

A. Mr. Pista.

Q. What is the next closest?

A. The Hill orchard, I believe.

Q. Is it affected by dust?

A. To a certain extent it was.

Q. How do you know that?

A. From driving in there.

Q. You have driven in there? A. I have.

Q. Have you discussed the dust with them?

A. No, sir.

Q. Do you know what happened there in 1943?

A. No, sir.

Q. Do you know on the first blossoming the cots dropped there? A. I did not.

Q. Do you know whether they did on the second one? A. No, sir.

Q. You are friendly with the Hills, aren't you?

A. The Hills aren't there any more.

Q. Were you friendly then?

A. What is that?

Q. Were you friendly in—?

A. They weren't there. I went there to see a man who was working.

Q. Who was that?

A. Mr. Brisage. I wanted him to help me work, but he was already working.

(Testimony of Leo Anderson.)

Q. When did you go to see him? Before or after the blossoming season? A. Before.

Q. Did you see him afterwards? A. No, sir.

Q. And that is your sole observation of the Hill ranch, is it? A. Yes, sir.

Q. What is the next closest ranch to your place?

A. I don't know—it could be Mr. Wilmuth.

Q. How far is Mr. Wilmuth's place from yours?

A. Oh, probably [457] three air miles.

Q. Are you friendly, or were you friendly with him? A. No.

Q. Unfriendly?

A. Not unfriendly, but I just don't go there. Nothing to go for.

Q. Did you ever visit his orchard in 1943?

A. No, sir.

Q. Did you ever discuss with him the 1943 crop?

A. No, sir.

Q. Do you know whether or not on his orchard the cots dropped off on this first cycle?

A. I do not know, sir.

Q. Do you know what they did on the second one? A. No, sir.

Q. Or on the third one? A. No, sir.

Q. Do you know his yield? A. No, I do not.

Q. Is there anybody in that immediate vicinity who is engaged in the apricot-growing business that you are friendly with and discussed matters with?

A. Mr. Pista.

Q. Mr. Pista is the only friend you have in that neighborhood that you have discussed the orchard business with, is that right?

(Testimony of Leo Anderson.)

A. Not the only friend, but the only one I happened to discuss apricots with.

Q. Have you any other friend in the neighborhood who is engaged in the orchard business raising apricots? A. Mr. Sterling; Mrs. Bardin.

Q. Mrs. Bardin; all right. Did you ever discuss with Mrs. Bardin the conditions on her ranch in 1943?

A. After my fruit was all gone she came to see me and told me she had a good crop. That is all the discussion, the conversation we had. [458]

Q. Did she tell you how big a crop she had?

A. No, she did not. She said she had a good crop that required spraying.

Q. Have you ever talked over with Mr. Naus or Mr. Harrington what you were to testify to here to-day? A. No, sir.

Q. You never had any discussion with them at all? A. I have talked to them, yes.

Q. Did you ever discuss with the Sterlings the 1943 crop? A. No, sir.

Q. Were you ever on their ranch?

A. Mr. Sterling's?

Q. The one you referred to.

A. Mr. Robert Sterling? No, I wasn't there.

Q. What is that? A. I wasn't up there.

Q. Which Sterling are you friendly with?

A. Robert Sterling.

The Court: Q. Is there anybody in the neighborhood there that you are unfriendly with?

(Testimony of Leo Anderson.)

A. No, not that I know of.

The Court: Why do you repeat the question about his being friendly with those people?

Mr. Moore: The reason I am doing that is this: Here is a man who is in the orchard business, and he has never discussed his crops with anybody, and to me it is utterly impossible—we lawyers talk things over.

The Court: I know, but you have not been on a ranch twenty years. After you have stayed in one spot for twenty years and attended to your work, you probably do not talk much to anybody. [459]

Mr. Moore: Not quite so long.

Mr. Naus: I know we sometimes talk too much. Farmers are not afflicted that way.

Mr. Moore: That is all.

Mr. Naus: One or two questions.

#### Redirect Examination

Mr. Naus: Q. You say Mr. Wilmuth is what distance away from your place, his orchard?

A. I should judge between two and three miles.

Q. What did you estimate the distance of the Wilmuth apricot orchard from the stacks of this Permanente plant?

A. That would be probably three miles and three hundred yards, something like that.

Mr. Naus: That is all.

(Thereupon a recess was taken until 2:00 o'clock p. m.) [460]

Wednesday, September 20, 1944

2:00 p. m.

The Court: Proceed, gentlemen.

Mr. Moore: Call Mr. Packard.

### WALTER E. PACKARD

called for the defendant; sworn.

The Clerk: What is your name?

A. Walter E. Packard.

#### Direct Examination

Mr. Moore: Q. Where do you live, Mr. Packard? A. I live in Berkeley.

Q. What business are you engaged in?

A. I am an agricultural engineer,— an agricultural consultant, really.

Q. Have you been employed in this case?

A. Yes.

Q. By whom?

A. By the Permanente Metals Corporation.

Q. Will you kindly state in a brief way to his Honor your qualifications—your educational background and qualifications.

A. Why, I first graduated from Iowa State College at Ames in 1907, four-year course in agriculture; then in 1909 I graduated from the University of California also in agriculture. Then for ten years I was with the University of California first as superintendent of the Imperial Valley experiment farm, and later in charge of the agricultural extension work in the counties in the San Joaquin Valley and in Southern California. After that I

(Testimony of Walter E. Packard.)

spent most of my time as consultant in [461] agricultural matters. For three years I was in Mexico in charge of the development of irrigation projects for the Mexican government, making soil surveys and other plans of the development, and otherwise consulting both the public and private agencies.

Q. Now, Mr. Packard, I am going to hand you a color map or diagram and ask you in regard thereto. I hand you a diagram purporting to show the Pista ranch, and ask you if you prepared that.

A. Yes.

Q. Can you tell me how you prepared it?

A. Yes; I prepared this from an air map showing this general territory of the map in the possession of the Agricultural Adjustment Administration in Salinas. I had access to the map there, and I made a copy of it on thin paper; then I made this enlargement by the use of a pentograph, so in general it shows the same relationship.

Mr. Moore: We don't claim that it is scalable in any way.

Mr. Naus: I presume it is copied from the data that they have down there in that Watsonville office of the Soil Service of the Federal Government.

The Witness: The same thing—same type.

Mr. Naus: It isn't the same type. It is the very thing rather than the same type—the same thing as what you copied it from, I take it, is that right?

The Witness: The maps were taken during different years, and I am not at all sure that this is the same as for some of [462] the years.

(Testimony of Walter E. Packard.)

Mr. Naus: What I meant to say, if the Court please, if I gathered that that is a true copy of what this soil survey shows—I know that at Watsonville they have been doing some very good, careful survey—then I won't question it if it is from their data.

Mr. Moore: That is correct.

Q. You have filled in there, Mr. Packard, have you not, in a more or less rough way the Pista ranch and the type of land and the type of trees that are on that? A. Yes.

Q. And the Pista ranch is the one that is surrounded by the heavy black line, is that correct?

A. Yes.

Q. And this twisting line that runs through there is that a creek?? A. Yes.

Q. To the north of the creek you have two areas marked "Young apricots on river sand," and "Young apricots on coast"—is it?

A. "Coarse."

Q. "—coarse sand." Down at the other end you have in pink marking, "Replants." A. Yes.

Q. And then "Hill Land," which is in white?

A. Yes.

Q. And the balance of the Pista ranch is in white? A. Yes.

Q. Is that correct? A. Yes.

Q. The part of the Pista ranch that is in white, does that constitute the apricot orchard?

A. Yes.

Q. The young apricots are not yet in production?

A. No. [463]

(Testimony of Walter E. Packard.)

Q. And the hill land has apricots on it, is that correct? A. Yes.

Q. But they are not the same type of ranch, as we might term it, as the balance—I mean the hill land?

A. It is a different type of soil; it is not irrigated, and the trees are stunted.

Q. How about the replants? Are they producing?

A. They are planted to apples and not yet in production, and in some cases young apricots not yet in production.

Mr. Moore: I will offer this, Mr. Naus.

(The map was marked Defendant's Exhibit M in evidence.)

Mr. Moore: Q. When did you first visit the Pista ranch? A. On July 2, 1943.

Q. That was after the pollinization period?

A. Yes.

Q. You weren't present or in that vicinity during the pollinization period, were you?

A. No, I was not.

Q. In other words, the first time you observed these trees on the Pista ranch was in July 1943?

A. Yes.

Q. Now, on that particular trip did you observe the trees on other ranches in the vicinity?

A. Yes.

Q. Can you tell us what particular ranches you visited on that first trip?

A. I visited the Pista ranch first and noticed

(Testimony of Walter E. Packard.)

the dust condition on that ranch. Then I visited the Anderson ranch, the Kern ranch, the Hill property, the Sterling property, and that was all on that first July 2 trip.

Q. Have you since that time had occasion to visit those [464] particular ranches and other ranches in the vicinity? A. Yes.

Q. Can you give us an idea how many times you have been down there observing the ranches and trees and fruit and its condition?

A. Well, I have been down at least twelve times, I should say.

Q. And were you there during the harvesting season in 1943? A. Yes.

Q. Approximately when was that, Mr. Packard?

A. That was the first part of July.

Q. That is when it started, was it?

A. Yes, and it finished in July.

Q. Were you present on the Pista ranch during the harvesting? A. Yes.

Q. Did you visit other ranches in the vicinity during the harvesting? A. Yes.

Q. And subsequent to that time did you visit those ranches again? A. Yes.

Q. Did you visit those ranches in the pollination period of 1944? A. Yes.

Q. And did you observe at that time the process of pollinization on those ranches, and what was going on? I mean—

A. I don't know exactly how you could observe

(Testimony of Walter E. Packard.)

the process of pollinization. I observed the condition of the trees at that time, yes.

Q. And the condition of the blooms?

A. Yes. [465]

Q. And the apparent or possible yield and all the other matters connected with the orchard?

A. Yes.

Q. Did you visit the orchards again in 1944 during the harvesting period? A. Yes.

Q. In other words, from July 1943 to date over the course of a dozen trips you have had occasion to observe those orchards in the vicinity of Natividad during the various parts of the year relative to the condition of the trees and all matters connected with the horticulture of these trees or agriculture, or whatever we might term it?

A. Yes.

Q. Did you visit any other ranches in or about Monterey County since July 1943? A. Yes.

Q. Can you relate to his Honor what other ranches you visited.

A. I visited the Lester Sterling ranch, the Barbin ranch, the ranch belonging to the California Orchards Company near King City, the Eiper property; several ranches, or four or five ranches in the neighborhood of Aromas in San Benito County; Mr. Johnson's ranch just north of Hollister in San Benito County; Mr. Wilmoth's ranch; Mr. Reeves'—Dr. Reeves' ranch; and think that is all.

Q. And on these visits that you refer to did

(Testimony of Walter E. Packard.)

you talk to the owners or managers of these various ranches? A. Yes.

Q. Relative to their crops? A. Yes.

Q. Both in 1943 and 1944? A. Yes.

Q. Did you discuss with them the conditions that existed in [466] the year 1943? A. Yes.

Q. In other words, you discussed their entire crop situation during that period of time, did you?

A. Yes.

Q. And did you discuss with any of the officials of Monterey County connected with agriculture the conditions that existed, or, rather, the yield had in 1943? A. Yes.

Q. And did you discuss with them the cause of the yield? A. Yes.

Q. Or lack of yield? A. Yes.

Q. Whom did you discuss those matters with?

A. I discussed them with Mr. Lewis and Mr. Tavernetti.

Q. Who is Mr. Tavernetti?

A. Mr. Tavernetti is the county agent—farm adviser.

Q. Farm adviser? A. Yes.

Q. Did you get the yields of Monterey County and other counties in the vicinity for a number of years? A. Yes.

Q. Did you get the yields throughout the State?

A. Yes.

Q. And was there a short or a long crop in 1943 throughout the State?

Mr. Naus: Objected to as calling for hearsay.

(Testimony of Walter E. Packard.)

Apparently the witness wants to summarize some hearsay he has heard. If there are official publications giving the yield, I make no objection, but I certainly—

Mr. Moore: That hasn't been questioned so far, that there was a short yield in the State, Mr. Naus.

Mr. Naus: Well, I know. There is no question about that, Mr. Moore, but it still doesn't go to the point that you are entitled to ask this witness to give us some hearsay.

Mr. Moore: I am just asking the simple question, which has not been denied—that has been testified to quite a number of times by everyone—that there was a short crop. It is merely a preliminary question.

Mr. Naus: If the Court please, after asking all the people he has talked to, he is asking the witness, who apparently was not there—he is asking him to give it in the form of hearsay.

The Court: Do you know of your own knowledge—

The Witness: The records.

The Court (continuing): —the yield?

The Witness: From reading the records of the State, official records, yes, sir.

Mr. Naus: If there are any official records—

The Court: You are entitled to the records.

Mr. Naus: If there are any official records, if they are produced and I recognize them, I will make no objection.

Mr. Moore: Q. All right. Mr. Packard, will you produce them?

(Testimony of Walter E. Packard.)

A. The yields for the State for 1943—

Mr. Naus: One moment. He hasn't asked the witness to read off anything. He just asked him to produce the records.

The Witness: Excuse me. [468]

Mr. Moore: He has produced from the University of California College of Agriculture, Agricultural Experiment Station, Berkeley, California, Deciduous Fruit Statistics as of January 1943, by S. W. Shear dated June 19, 1943.

Mr. Naus: If the Court please, I will make no objection to that document being recognized as being what it purports to be; that it be marked for identification, and any of the statistical portions bearing upon apricots in California, I will have no controversy about that.

Mr. Moore: All right.

(The book was marked Defendant's Exhibit N for Identification.)

Mr. Naus: Do you want to indicate or designate the particular pages that you are seeking to draw the Court's attention to now?

Mr. Moore: You are drawing the Court's attention—

Mr. Naus: No, I am making an objection. All I am doing is making an objection to the witness' retailing some hearsay.

Mr. Moore: Q. From a study of this—have you any other documents?

A. I have the records for counties.

Q. And from this—you have studied this?

(Testimony of Walter E. Packard.)

A. Yes.

Q. Does this show that there was a subnormal yield throughout the State in 1943?

Mr. Naus: One moment. I now object to that as calling for secondary evidence of the document. The document, if it is a statistical study, will speak for itself rather than having someone's version fastened on it.

Mr. Moore: I can spend hours on these statistics, your Honor. It is merely preliminary. We have gone on here for four or five days, and this is the first time that there has been any question that there was a short crop in 1943.

Mr. Naus: If the Court please, there is no question about it now, but I say that the writing should speak for itself instead of the witness trying to speak for it.

Mr. Moore: I am merely laying the basis to show his experience and knowledge, and I simply asked him a very simple question, whether there was a short yield so far as he knew in 1943 in the apricot crop.

The Court: It is admitted there was.

Mr. Moore: Yes, it is admitted.

The Court: All right; proceed.

Mr. Moore: Q. Now, Mr. Packard, relative to this short crop in 1943 did you discuss with various people, experts in the State, the cause of that short crop from what they knew? A. Yes.

Q. Whom did you discuss that with?

A. I discussed that with Dr. Rudolph of the

(Testimony of Walter E. Packard.)

deciduous fruit experiment station at San Jose. I discussed it with the Horticultural Commissioner of Santa Clara County, the Horticultural Commissioner for San Benito County, the County Agent in San Benito County, both the [470] County Agent and the Horticultural Commissioner in Monterey County; with Professor Ralph Smith of the University; with Professor Tufts of the University; with Dr. Yarwood of the University; with Dr. Bohmer and Dr.—three or four others whose names just don't come of my mind just now.

Q. Did you discuss it with various orchardists?

A. Yes.

Q. Did you discuss the appearance of their trees with them? A. Yes.

Q. And what they had observed in the year 1943? A. Their experience in '43, yes.

Q. Their experience in their orchards?

A. Yes.

Q. Did you discuss with them the weather conditions that had existed in 1943 at that time in their vicinity? A. Yes.

Q. In your studies did you secure various statistical data relative to yield and various other matters connected with the apricot crops of 1943?

A. Yes. ,

Q. From all that data and information did you make various studies and observations and reach various conclusions as to the cause—as to the extent of the short crop in California and also the

(Testimony of Walter E. Packard.)

extent of the short crop in San Benito, Monterey, and those counties in the vicinity of Natividad?

A. Yes.

Q. As a matter of fact, to the best of your ability as an expert in this line, you have secured all the data that was possible to get as to the shortage of the crop in 1943 and the cause of it through statistical data, conferences with [471] county officials, orchardists, and everybody who had information on that subject? A. I tried to, yes.

Q. And from all that information you have been able to form exact conclusions, have you, as to the extent of this short crop and the reasons for it?

A. Yes.

Q. I am asking you now as an expert, with that data at your disposal that you have just outlined, what, in your opinion, was the cause of the short crop throughout the State of California in 1943?

Mr. Naus: Objected to upon the grounds, first, that it is perfectly apparent from the witness' answers so far that he has based the conclusion or opinion that is now called for by the question in whole or in part upon hearsay, what was told to him by others.

Mr. Moore: I think that an expert witness—

Mr. Naus: Please. I haven't finished, Mr. Moore. I don't like interruptions.

Mr. Moore: I thought you were through.

Mr. Naus: No, I am not. So as to leave no doubt about the objection, I would like to restate it in complete continuous form.

(Testimony of Walter E. Packard.)

I object to the question upon the grounds, first, that it appears from the answers of the witness thus far that the conclusion or opinion that the question calls for is one that would be drawn in whole or in part from hearsay—the hearsay [472] indicated by his previous answers; and, secondly, upon the ground that it is immaterial what may have been the cause of a short crop throughout the State of California as a whole away from the particular apricot-bearing region in controversy here.

Mr. Moore: I want to interrupt you a minute. When I say the State of California as a whole, I am not intending to exclude this particular area. I am asking in regard to the whole State.

In reply, your Honor, to Mr. Naus' argument, it has always been my understanding that all opinion evidence has to be in the nature of hearsay. The very basis of practically all opinion evidence is hearsay. No man can make a study of a subject that is not in large part based upon hearsay. I submit the question is a proper question. Having qualified him as an expert, shown what his investigations consisted of, the very exhaustive investigation as to the causes, and as an expert in his line, he is entitled, having weighed all those facts and all the knowledge that has come to him of conditions throughout the State to inform your Honor what, in his opinion—it is an opinion; we don't claim it is a statement of fact; we claim it is a statement of opinion—what in his opinion was the cause of the short crop of apricots in California in 1943.

(Testimony of Walter E. Packard.)

Mr. Naus: Have you finished, Mr. Moore?

Mr. Moore: Yes.

Mr. Naus: I merely wish to point out in a short way that [473] I concede that science experts and the like have got to reach into studies of all the scientists in the past so far as known, so far as books show them. If this were a matter that were one merely calling for an opinion and conclusion of the witness in a particular scientific field, and if he had read the scientific literature and formed his opinion along with other matters, no objection could be possibly soundly made by me. But when you go to the point of talking to different orchard owners, Tom, Dick and Harry, everybody who is not a scientist, and then in turn seek to base an opinion and conclusion on what people may have told you—they may have told you facts, they may have told you conjectures, they may have told you accurate or inaccurate opinions or conclusions—then I say it is the most vicious calling for hearsay.

Mr. Moore: I make this answer to it: I have always understood that courts were not for the exclusion of evidence but rather for the admission of evidence. It is admitted that in the State of California, your Honor, in 1943, that there was a short crop. Now, there must have been a cause for that short crop throughout the State. There is no one human being in this State of California that could get on this witness stand and tell your Honor what the cause of the short crop in 1943 was throughout the State of California. It has to be and only

(Testimony of Walter E. Packard.)

can be determined by the consensus of learned opinion generally as to a crop that extends over a whole area of thousands of [474] miles; it has to be a compilation of facts, statistics, and opinions, and each and all of those weighed by someone who is an expert. As I say, there is no human being in the world today who could assign and inform your Honor as to the cause of the short crop in Northern California in the year 1943—and it is admittedly a short crop—except through the medium of just such a process as we have pursued here. As I understand it, we are not presenting it as a fact; we are presenting it as this man's opinion as derived from all this data that he spent so much time securing.

Mr. Naus: I submit the matter.

The Court: The objection will be overruled subject to a motion to strike over the objection of Mr. Naus. You may answer.

The Witness: Could you read the question again, please?

(Question read.)

A. In broad analysis, it was weather conditions.

Mr. Moore: Q. Will you explain that a little more fully?

A. Yes. The weather conditions during—

Mr. Naus: I assume, Mr. Moore, it is understood that this subsequent question carries the same objection?

Mr. Moore: Same objection as to anything derived from his studies.

(Testimony of Walter E. Packard.)

A. The weather conditions during the winter and spring in 1943 were unusual in several particulars. In the first place, the [475] winter was unusually warm, which, according to studies made by the University, led to a very unusual dropping of buds, both leaf buds and fruit buds, during the following period. That was one cause for dropping of buds—an excessive dropping of buds in 1943. Also during February—during January, February, and the first half of March—particularly during the last part of February and the first half of March—it rained nearly every day; it was very foggy; it was unusually warm; and as a result there was an excessive, and unprecedented, really, development of jacket rot. There was quite a good deal of development of brown rot also, but primarily jacket rot of two kinds. The jacket rot developed in all portions of the State where they grow apricots and is assigned as a principal cause for the dropping of fruit in 1943. [476]

The third reason—the third factor is this: that during the early portion of the blooming period, there was rain every day, and the rain, itself, prevented pollination not only in the Natividad area, but in other areas, and as a result the flowers were not pollinated and the young fruit dropped off before it—simply because it was not pollinated. Now, later on, beginning about the 11th of March, there was a very decided change in climate, the records show that. The temperature dropped from—

Mr. Naus: One moment. One moment, please. .

(Testimony of Walter E. Packard.)

If he is going to say what the records show, I would ask that the record be produced instead.

Mr. Moore: Well, all right.

Q. Are you referring now to the State or Monterey County?

A. I am referring to the records—the weather records in Salinas.

Q. In Salinas? A. Yes.

Q. I was asking you—you got off of it a little bit, Mr. Packard. I was asking you throughout the State. A. I see.

Q. Not particularly Monterey County.

Mr. Naus: Your Honor understands that I make no objection to weather records. I think they will tell more than the witness could remember about them.

Mr. Moore: I am going to come to that, Mr. Naus, in Monterey County; he hasn't the weather records for the State; he only has [477] them for Monterey County.

Q. Does that cover the general field in regard to the State as a whole?

A. Those are the three primary causes for dropping buds, all associated with weather.

Q. From your studies and the information that you secured in Monterey County, there was a short crop there, was there? A. Yes.

Q. Have you the records showing the crop yields in Monterey County?

A. Yes. Here is the '43 record (handing paper to counsel).

(Testimony of Walter E. Packard.)

Q. Have you other records there?

A. (The witness handed other papers to counsel.)

Mr. Naus: This first one, apparently, was confined to 1938; I thought your question was 1943.

Mr. Moore: Pardon me; you didn't understand me, Mr. Naus. *ere* is '38, '39, '40, '41, '42 and '43.

Mr. Naus: I thought your question was addressed only to '43.

Mr. Moore: I think I asked him if there was a short crop in '43 and you objected.

Mr. Naus: Would your Honor indulge me for a moment until I inquire of Mr. Lewis, the officer, whether these were official. I assume they are. I don't know.

I will accept these reports as proper official reports, if the Court please.

Mr. Moore: Do you want them marked for identification?

Mr. Naus: That is entirely up to you. If you wish to [478] prove them, I make no objection as long as you prove them by the record.

Mr. Moore: All right.

The Court: If there is no question about the records, they might as well be admitted.

Mr. Moore: Might as well be admitted.

(The documents referred to were marked Defendant's Exhibit O in evidence.)

Mr. Moore: Q. Now, Mr. Packard, you have produced the agricultural reports of Monterey County from 1938 to and including 1943?

(Testimony of Walter E. Packard.)

A. Yes.

Q. Which have been marked here as Defendant's Exhibit O? A. Yes.

Q. I will ask you if you have studied those reports? A. Yes.

Q. And can you tell us whether there was a short crop in Monterey County in 1943?

A. Yes.

Mr. Naus: If the Court please, in asking that, he is again calling for secondary evidence of a writing, because by the comparison of one of those reports with another you can see whether a figure is mathematically larger or smaller than another.

Mr. Moore: I have always understood that people who may be experts, like expert accountants, can testify to a summary, and it is open to cross-examination instead of introducing each item. I can introduce them if Mr. Naus persists, each [479] year.

Mr. Naus: They are all in already; any of us can read them. The whole thing is in evidence already. It shows by year the total number of acres in the county, the total number of pounds of yield from them.

The Court: Very well.

Mr. Naus: In a written brief or the like, we could type it out.

The Court: Q. Briefly outline what these records disclose in your own way.

A. These records show that in 1943 there was a lower crop in Monterey County than any of the

(Testimony of Walter E. Packard.)

years of record here. The record in 1938 was 138,540 boxes. In 1939 the record shows production of 180,102 boxes. In 1940 the record shows a yield of 140,325 boxes. The record for '41 shows a yield of 166,800 boxes. The yield for 1942 shows a yield of 204,500 boxes, and for 1943, shows a yield of 90,450 boxes.

Mr. Moore: Q. You have already related the various investigations you have made, both statewide and in Monterey County. Directing your attention to the investigation that you made in Monterey County that you have outlined, in your opinion as an expert, from those studies that you made and investigations you made, what was the cause of the short crop in Monterey County in 1943?

A. Weather conditions.

Mr. Moore: The same objection—did you want it to that, Mr. Naus? [480]

Mr. Naus: Well, it is addressed to a minor field of the other subject. I assume that was taken up before, and I assume his answer would be the same.

Mr. Moore: Q. Will you explain these weather conditions in Monterey County?

A. Yes. In the spring—in the winter of 1942-43 there was an unusually warm period which brought the cots on earlier than usual that year and extended the blossoming period over a longer period, and also caused a dropping of buds during the early part of—or during the early part of the blooming period. There was also a rain almost continuously from the middle of February until the middle of March.

(Testimony of Walter E. Packard.)

Mr. Moore: Now, we have those weather records, Mr. Naus, if you care for them.

Mr. Naus: That is entirely up to you, what you wish to prove. You are putting in your own case.

Mr. Moore: And you objected. We didn't want any issue with regard to whether—

Mr. Naus: No, I did not. I never objected to them. I only objected to this witness trying to tell from hearsay memory what they read. I stated to his Honor that I would make no objection to official reports. I did object to this witness telling anything he read from reports.

The Court: If you have the reports let us proceed.

Mr. Moore: I have the reports. I don't want to get in [481] an argument over nothing.

The Court: This is '42-43 you want?

The Witness: '43.

Mr. Moore: Q. Haven't you that in book form someplace?

A. No—yes, I have the records scattered—the original records from which I took those, but then they are rather scattered out. I copied these figures from the official records which I have with me. These are, however—

The Court: No objection to them, subject to correction?

Mr. Naus: I will be glad to have them marked for identification and used, with an opportunity to me, however, for study.

Mr. Moore: All right.

(Testimony of Walter E. Packard.)

Mr. Naus: I haven't even seen his memoranda or anything to know that they are truly depicted.

Mr. Moore: He copied them out of the records which are available.

Mr. Naus: Surely; they can be checked.

A. The rainfall records taken at Salinas by the United States Department of Commerce Weather Bureau show rain beginning on February 16, 1943; it rained on the 16th and 17th; then there were three days without rain; then there was continuous rain from the 21st to the 26th; then there were two—

Mr. Naus: What month is he talking about?

Mr. Moore: March. [482]

The Witness: Two days in February—

Mr. Moore: Just a minute. I may be mistaken.

Q. Mr. Packard, will you start at the beginning again? I think you jumped over a month.

The Court: He started in '43. You have the '42 records?

The Witness: I have the record for a number of years, your Honor.

The Court: Covering this period—it begins with '42, doesn't it?

The Witness: Yes.

The Court: Yes. You started with '43.

Mr. Moore: I am asking now as to the weather conditions during the pollinization period. He has those in his hand.

Mr. Naus: Of what year?

Mr. Moore: '43.

(Testimony of Walter E. Packard.)

Mr. Naus: I merely asked for those dates. Was he giving February or March?

Mr. Moore: I have asked him to start over so we will get it clear. Starting in the month of February 1943 in the neighborhood of Salinas—

The Court: May I make a suggestion?

Mr. Moore: Yes.

The Court: This problem has to do with the weather.

Mr. Moore: Yes.

The Court: If it affected it at all, it began before '43. [483]

Mr. Moore: We will go back and get the '42 records.

Mr. Naus: How could it affect the '43 crop? He has answered so far.

Mr. Moore: He said the warm winter affected it; the trees do not force the sap down.

The Court: The growing season would take in '42 and '43.

Mr. Naus: Of buds, yes.

The Court: That is what I mean.

Mr. Moore: Q. What have you there?

A. This is the temperature record. I have both the temperature record and the rainfall record; I have them both.

Mr. Moore: Can't we introduce that subject to Mr. Naus checking it, instead of taking up the time here?

Mr. Naus: I thought so. If you had confined yourself to these records instead of using the wit-

(Testimony of Walter E. Packard.)

ness we would have had a paper marked and passed on.

The Court: Yes; we can get along with this copy.

Mr. Naus: As a matter of fact, I think I have the temperature and rainfall record for February and March 1943, copies of them, right in my hand so I can follow it.

The Court: All right.

Mr. Moore: Q. What have you?

A. I have rainfall records for 1942 and for 1943 and the temperatures from October to December 1942 and January through March 1943.

Q. Are those by months or days?

A. By days and months, of [484] course.

Mr. Moore: Well, pardon me just a moment.

Mr. Naus: Certainly.

Mr. Moore: This is just a great mass of figures.

The Court: He has got it by days and months, he says.

Mr. Naus: I will carry out my understanding with the Court. Any summary that he has made here, I have no objection to its being used, provided time is given to me subsequently to check it without taking up the Court's time. I am unable to look at it and say whether it is wrong or right. I assume he copied it correctly; I don't know. But there are two papers you handed me; I can't even tell what month or year they refer to.

Mr. Moore: If you will just let me go, maybe I can inform you.

(Testimony of Walter E. Packard.)

Q. Mr. Packard, you have handed me one paper with a great mass of figures on it. What does that represent?

A. The paper that I now hold in my hand shows the temperature record taken in Salinas from October to December inclusive in 1942, and from January to March, inclusive, 1943.

Q. Is that by days? A. Yes.

Q. That is the—

A. Maximum and minimum temperatures by days.

Q. You took this—copied it from the official record, is that true? A. Yes. [485]

Mr. Moore: I will ask that that be marked for identification.

The Court: Let it be marked.

(The paper was marked Defendant's Exhibit P for Identification.)

Mr. Moore: Q. You have produced certain papers here that do not have any month on them, having to do with rainfall at Salinas. Can you tell us what those are?

A. The first paper shows the rainfall record for 1942 by days and months.

Q. Pardon me just a moment. This is for 1942 by days and months.

Mr. Naus: Subject to the same understanding.

Mr. Moore: Yes. We will ask that this be marked for identification.

(The paper was marked Defendant's Exhibit Q for Identification.)

(Testimony of Walter E. Packard.)

Mr. Moore: Q. And the one you hand me is what?

A. This is the record of rainfall for 1943 by days and months.

Mr. Moore: I will ask that this be marked for identification.

The Court: Let it be marked.

(The paper was marked Defendant's Exhibit R for Identification.)

Mr. Moore: Q. Now, Mr. Packard—

A. I am looking for the—I have here a record of the clear, partly cloudy, and [486] cloudy days during the months of January, February and March, inclusive, 1943, by days and months.

Q. And that was taken from what records?

A. That was taken from the U. S. Weather Bureau records at Salinas.

Mr. Moore: I will ask that this be marked as an exhibit for identification.

The Court: It may be marked.

Mr. Naus: With the same understanding.

(The document was marked Defendant's Exhibit S for Identification.)

Mr. Moore: Q. Now from a study of these records and other information, or a study of these records—I will put it this way: These records are the basis of your statement that the winter of 1943 was a warm winter, is that correct?

A. That is right; partly the observation—partly it is my own observation of that year, and partly

(Testimony of Walter E. Packard.)

from conversations I have had with people in the county regarding that.

Q. Turning now to the pollinization period of 1943, can you tell us what the rainfall was at Salinas in the latter part of February 1943 up to about the 10th of March, if you will give those figures. Mr. Naus, I believe, has them, by days.

A. There was rain on February 2—or 16th, excuse me; another rain on February 17; then there were three days without rain. It rained continuously from the 21st to the 26th, inclusive. It did not rain then for a period of four days. Then on the 3rd [487] of March it rained continuously until March 11. It then cleared. There was a rain on the 14th; again on the 17th; there was a trace on the 18th, a trace on the 20th, a trace on the 21st, a little rain on the 22nd, and the only other rain was on the 29th of March.

Q. And from a study of these records and from the information that you have gathered, it is your opinion that the short crop in Monterey County in 1943 was due to the weather, is that correct?

A. Yes.

Q. When you arrived there, it was in July 1943—in and about that? A. Yes.

Q. And you visited all of these various ranches that you have named? A. Yes.

Q. And so far as the number of apricots on the trees was concerned—I don't mean by counting them, but I mean so far as whether they were heavily laden or lightly laden with fruit, did you

(Testimony of Walter E. Packard.)

find the same conditions generally existed throughout the county as existed on the Pista ranch, or did you find it different—not getting into percentage, but I mean in a general way were the conditions on the Pista ranch, so far as cots were concerned, similar to those which existed throughout the county?

A. The conditions varied regarding yield in 1943 in the orchards that I visited.

Q. Some were higher than others?

A. Yes.

Q. And some were lower than others?

A. Yes. [488]

Q. And did you check those yields as nearly as you could? A. Yes.

Q. Did you find others in the county that had as low a yield as Pista's? A. Yes.

Q. Some had more, did they?

A. Some had more, and others had less.

Q. Did you find anyone that you came in contact with that said they had a normal yield?

A. No. Well, with this exception: I think Mr. Bardin, or Mrs. Bardin, had what you might call a normal yield. It was 80 percent normal, which is within the range of normal—60 to 80 percent of normal, which I think would be generally considered a rather normal yield.

Q. Did you visit the California Orchard properties? A. Yes.

Q. They have two properties, have they?

A. There are two properties under one manage-

(Testimony of Walter E. Packard.)

ment; one belongs to the company; the other belongs to Mr. Thorpe, who is a stockholder.

Q. How far apart are these two orchards?

A. I can't tell you exactly, but I think within just a short distance.

Q. What do you mean?

A. Perhaps two miles.

Q. And they are located where?

A. Near King City.

The Court: Q. Is King City along the coast?

A. King City is in the valley of the river there, in the same valley that these other ranches are in, except toward the upper end of the valley.

Mr. Moore: Q. Was there any variation in the yield of [489] those two orchards managed by the same people within two miles of each other?

A. Yes.

Q. Approximately what?

A. One of the orchards in the center of the valley yielded about 12 percent of normal, and the other yielded about 40 percent.

Q. And you found that same variation generally throughout the county, did you?

A. Yes, I did.

Q. Did you have occasion to observe the dust on the Pista orchard? A. Yes.

Q. There was dust on the orchard when you observed it, was there? A. Yes.

Q. I am going to ask you—there has been evidence here that the short crop was caused by dust. I am going to ask you from an observation of the

(Testimony of Walter E. Packard.)

trees and the dust and the crop and your knowledge of it, was that dust on there in any way the cause of the short crop?

Mr. Naus: One moment. Objected to as calling for an opinion—presumably calling for an expert opinion in a field in which the witness has not so far been shown to have any knowledge—

Mr. Moore: All right.

Mr. Naus: Please let me finish.

Mr. Moore: Pardon me just a moment. May I interrupt just a moment?

Mr. Naus: No, I would rather you wouldn't. That is what [490] I am trying to stop.

Mr. Moore: I will withdraw the question if you will just let me say so at this stage.

Q. You inspected the orchard, did you?

A. Yes, sir.

Q. Will you describe, so far as the number of apricots were concerned, whether they were on the trees on uniform or un-uniform manner?

A. They were on the trees, so far as the individual trees were concerned, in a uniform manner. I saw no more fruit on the sides of the trees away from the mill than I saw on the trees—on the sides of the trees towards the mill. There was, however, a very distinct difference in the number of apricots on different trees. I observed two or three times as much on some trees as on others.

Q. You mean apricots?

A. Apricots, yes. So there was quite a variation in the trees within the orchard, but I saw no varia-

(Testimony of Walter E. Packard.)

tion of the setting of the fruit on either side of the trees.

Q. By that you mean the fruit that was set on the side towards the plant was as heavy as the fruit set on the side away from the plant?

A. So far as I could see, yes, sir.

Q. You made an observation in that regard, did you? A. Yes.

Q. Let me ask you, referring to this map, from your observation was there more dust on the trees in certain portions of this orchard than in others?

A. Yes.

Q. Will you point out the portion that had the larger amount of [491] dust as distinguished from that that had the smaller or lesser amount of dust?

A. Yes.

Q. You may take a pencil and mark it—if you will label it A showing where the trees were that had the larger amount of dust.

A. Yes, I found more dust apparent on the leaves of the trees and other vegetation in the south—southeastern portion of the ranch in the general vicinity of the house, which I am marking out and indicating by the letter A.

Q. Where did you find the lesser amount of dust?

A. I found the amount of dust rather uniform over the balance of the ranch.

Q. That is the low land down there—is it lower than the balance of the land? I mean, it slants down there?

A. No, but it is protected by hills here, and my

(Testimony of Walter E. Packard.)

feeling is that there may have been in a sense an eddy that may have caused more dropping of dust in this portion of the orchard than in the balance.

Q. Did you observe the trees so far as yield was concerned in that portion that is marked A?

A. Yes.

Q. Where you found a heavier deposit of dust?

A. Yes.

Q. And how did that compare with the yield on the other portion where the dust was lesser but uniform?

A. My observation was that, in general, the trees in that vicinity produced rather more heavily than the average of the orchard.

Q. In other words, the trees where the greater amount of dust [492] was produced more heavily than the balance, is that correct? A. Yes.

Mr. Naus: You have no counterclaim for that, Mr. Moore?

Mr. Moore: Well, it just shows how little dust had to do with this situation. [492-a]

Q. On the leaves, themselves, did you find any evidence of any causticity? A. No, I did not.

Mr. Moore: I am starting on a little different subject. Shall we proceed straight through, or what is your Honor's desire with regard to a recess?

The Court: Only to assist you gentlemen I was pressing it, hoping to get through today.

Mr. Naus: I haven't the slightest idea now how long he is going to have this gentleman on direct.

Mr. Moore: I will have him a half hour.

(Testimony of Walter E. Packard.)

The Court: Counsel is not as young as he used to be. He is asking for a recess. We shall take one.

Mr. Naus: I think we ought to concede that to him under the circumstances.

(Thereupon a brief recess was taken.)

Mr. Naus: We are now going in an enlarged way into botany, I take it?

Mr. Moore: That is it.

Q. Mr. Packard, in your many years in agriculture and the study of it, have you had occasion to study the pollination of plants? A. Yes.

Q. Have you had occasion to study the pollination of apricot plants? A. Yes.

Q. I will hand you a diagram, here, and ask you what this particular diagram represents.

A. That diagram represents a [493] cross section of an apricot blossom.

Mr. Naus: Wait a minute. Let us get this clear. Is it a cross section, or a longitudinal section, Mr. Moore? *In* looks longitudinal to me.

The Witness: Excuse me.

Mr. Naus: Which is it?

The Witness: It is a longitudinal cross section.

Mr. Naus: It is a longitudinal section.

Mr. Moore: Q. Whom was that prepared by?

A. By me. I prepared this from a bulletin of the University of California.

Q. And enlarged it? A. Yes.

Mr. Moore: We will ask that this be marked as an exhibit.

(Testimony of Walter E. Packard.)

Mr. Naus: If you will simply tell what you copied it from I will not question it.

Mr. Moore: Q. What did you copy it from, Mr. Packard?

Mr. Naus: Whose illustration, and what bulletin?

The Witness: If you will wait just a second, I have it here.

(The document in question was received in evidence and marked Defendant's Exhibit T.)

The Witness: It was taken from page 5 of Circular No. 62 on the subject of "Pollination of Deciduous Fruits, By Bees."

Mr. Naus: I ask that it be marked for identification. I will make no objection to the exhibit which you have just previously offered. [494]

(The document in question was marked Plaintiffs' Exhibit 17 For Identification.)

Mr. Moore: Q. Mr. Packard, taking this diagram, Exhibit T, would you explain the process of pollination? You might turn it so that his Honor can see it.

A. Pollination takes place by having the pollen, which is released by these anthers on the stamens, which is carried over onto the stigma of the pistil. There it comes in contact with a sugary, viscous material, fluid, that is excreted by the papillae on the surface of the stigma. When it comes in contact with this viscous material it begins to absorb moisture from it, it begins to swell, and then a por-

(Testimony of Walter E. Packard.)

tion of the outer coating breaks and the filament starts to grow, which extends down the style of the flower until it reaches the ovary here, where fertilization takes place, and that, in general, is the process of fertilization.

Q. There has been some reference here to self-pollination of the apricot. Just what is meant by that, or how does that occur?

A. The apricot is almost wholly self-pollinated. By that I mean the pollen from the stamens in the flower, itself, pollinate the pistil in the same flower. There is very little cross pollination from one tree to another. That is carried out in part prior to the opening of the flower and partly after the flower has opened up. During the earlier period of the flowering of the apricot blossom the pistil is not as long as shown in this picture. It does not extend above the stamens. [495] The stamens, however, develop pollen which is ripened before the stigma on the pistil is finally receptive. The pistil then pushes up through the stamens, at which time there is a possibility that there may be pollination there. However, most of the pollination of the apricot blossom is carried out by the aid of insects, largely bees and thrip insects and other insects which get into the flower and carry the pollen from the stamens to the stigma.

Mr. Naus: Do you remember the question? You only asked him what self-pollination was.

Mr. Moore: He has explained.

Mr. Naus: No, he is going on.

(Testimony of Walter E. Packard.)

Mr. Moore: It comes from the same blossom.

Mr. Naus: I just wondered if he remembered the question.

Mr. Moore: Yes, he did.

Q. You are speaking about self-pollination now, are you not? A. Yes, and I have finished.

Q. On the stigma, what relation in size does the ordinary pollen bear to the stigma?

A. The ordinary pollen is very minute. One flower may produce several thousand particles of pollen. The stigma of the pistil is, roughly, about the size of a pinhead, or in diameter perhaps would be a millimeter in diameter, about the size of a pinhead.

Q. How many pollens does it take to fertilize that? A. Just one.

Q. In other words, when just one pollen—which is a very [496] minute microscopic object, is that correct? A. Yes.

Q. —drops on this stigma, which perhaps is as large as a pinhead, fertilization takes place, is that correct? A. Yes.

Q. Have you had any occasion to make a study or read articles written by others with respect to the effect of Bordeaux mixture spray on orchards?

A. Yes.

Q. In the course of your studies in botany you have made some study of chemistry, have you?

A. Yes.

Q. I mean you know calcium carbonate and calcium oxide, dioxide? A. Yes.

(Testimony of Walter E. Packard.)

Q. What is Bordeaux mixture composed of, do you know?

A. Yes, it is a mixture of calcium hydroxide and copper sulphate.

Q. Do you know whether or not calcium hydroxide is at all caustic? A. Yes, it is caustic.

Q. Do you know whether calcium carbonate is caustic or not? A. It is not.

Q. But the calcium that is in the Bordeaux mixture is caustic, is that correct? A. Yes.

Q. What effect, if any, does caustic material landing on the stigma have?

A. Cistic material landing on the stigma would neutralize the acid reaction of the stigma.

Q. Would it affect fertilization?

A. Yes, if the area that is affected by the calcium hydroxide comes in contact with the pollen. If the pollen drops on a portion of the stigma that is not affected, of course, there would be no effect at all. [497]

Q. It is the killing of the pollen, is it, or the killing of the stigma and this watery substance? Which is it?

A. It is the killing of the pollen.

Q. In connection with the use of Bordeaux mixture, have you had occasion to study or read certain articles? A. Yes.

Q. There has been introduced in evidence here an article by Mr. Anderson. I call your attention to the article which has been introduced in evidence

(Testimony of Walter E. Packard.)  
as Plaintiff's Exhibit 8, by Paul J. Anderson. Have you read that? A. Yes.

Q. You have studied it, have you, and you know the contents of it? A. I do.

Q. I will not ask you if you have ever had occasion to read an article by Mr. MacDaniels and Mr. Hildebrand, of Cornell University and American Society of Horticulture, on the results of studies—

Mr. Naus: Show it to him.

Mr. Moore: Q. You have read and studied this particular article, have you? A. Yes.

Q. Do you know the contents thereof?

A. Yes.

Q. That article contains studies in regard to the effect of Bordeaux mixture on pollinization?

A. Yes.

Mr. Moore: I will ask that this be marked with the appropriate number.

(The document was marked Defendant's Exhibit U in evidence.)

#### DEFENDANTS' EXHIBIT U

The investigation of the effect of fungicides and bactericides applied to the open blossoms on the set of fruit of the apple was begun in 1929 and has been carried on in every year since. The results of much of this research have appeared in a series of publications as indicated in the bibliography attached. The present report includes the results obtained during the years from 1934 to 1937 inclusive.

(Testimony of Walter E. Packard.)

The authors are of the opinion that the problem during this time has been fairly well worked through in its essential features, at least as far as the practical implications are concerned.

### Discussion and Conclusions

On the basis of the data obtained in this investigation, it can be stated with some assurance that from a practical standpoint it is possible to spray or dust apple trees while in bloom with the various bactericides tried without seriously cutting down the set of fruit. This is particularly true of Bordeaux mixture 1—3—50 and the 20—80 copper-lime dust which have been tested thoroughly under orchard conditions.

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Mr. Moore: Q. I will hand you another article published by [498] the University of California, College of Agriculture, Agricultural Experiment Station, Berkeley, California, "Monilia Blossom Blight (Brown Rot) of Apricots." I call your attention to pages 40 and 41 thereof relative to the effect of Bordeaux mixture on blossoming. Have you read that article? A. Yes.

Q. Are you familiar with the contents of it?

A. Yes.

Mr. Moore: I will ask that that be admitted in evidence.

(The document in question was thereupon received in evidence and marked Defendant's Exhibit V.)

(Testimony of Walter E. Packard.)

## DEFENDANT'S EXHIBIT V

There is no danger of burning either the buds or the blossoms of the apricot with a properly made Bordeaux. As many as five applications of Bordeaux 8-8-50 were tried experimentally to large blocks of trees in the H. Owen orchard at Haywards in 1923 without injury of any kind. The fruit at harvest was large, abundant and of excellent quality. In 1922 Mr. C. Frost of Berryessa sprayed four times with Bordeaux 5-5-50 starting in the red bud stage and ending in the full bloom. The year was damp, and in the same vicinity the disease was very destructive. Yet in a block of 38 trees, typical of Mr. Frost's orchard, the average number of infections was 1. In one corner of the orchard where the disease offered its greatest resistance to control the average number of infections per tree in a block of 34 trees was only 13.

Bordeaux applied to the open blossoms does not interfere with pollination which probably takes place in the case of the apricot before the blossoms open. Experiments with new fungicides frequently led to the burning of the outer portions of the buds to such an extent that they never opened. Yet when the burning had not killed the reproductive parts within, these buds set fruit which eventually burst through the old, unopened flower parts.

(Testimony of Walter E. Packard.)

Mr. Moore: Q. I will hand you a typewritten article, "The Influence of Cement Dust on Vegetation."

Mr. Naus: If it is a typewritten article, you are getting into another field. I can typewrite one—in fact, I will.

Mr. Moore: Q. It is written by Professor R. Ewert. Do you know who Professor Ewert is?

A. Yes.

Q. Who is he?

A. He is a German scientist who has made a study of various subjects, including the effect of cement dust on vegetation.

Q. Has he written any number of articles on subjects of that character?

A. Yes, he is quite a distinguished German scientist.

Q. You did not answer my direct question. Has he written quite a number of articles?

A. Yes.

Q. On various subjects connected with that, kindred subjects, I mean? A. Yes.

Q. Have those articles been published, do you know, in scientific [499] magazines in this country?

A. Yes. Reviews of them have been.

Q. He is quite well known by reputation in the profession, is he? A. Yes.

Q. And have you read that article that has to do with the effect of cement dust on agriculture?

A. Yes.

Mr. Moore: I will ask that that be marked.

(Testimony of Walter E. Packard.)

Mr. Naus: I object to this last typewritten document on the ground it does not appear that it has ever been published in the world in the sense of the other articles and subjected to any widespread criticism or any criticism at all. The circumstances of the typewriting and the occasion have not been shown and therefore it is unsworn hearsay.

Mr. Moore: We will ask that it be marked for identification, anyhow, since he has studied that particular article.

The Court: It may be admitted for purposes of identification.

(The document was marked Defendant's Exhibit W For Identification.)

Mr. Moore: Q. From your studies and from your readings, from your observation of the trees on the Pista ranch that you have already described in evidence—I mean the location of the fruit—from your studies of the causes of the crop failure throughout the State in 1943, and your studies relative to the crop failure in Monterey County in 1943, and your knowledge of botany and the explanation of the method of pollination that [500] takes place in an apricot as you pointed out on Defendant's Exhibit T, I ask you in your opinion as an expert did any dust that was located on the Pista orchard have anything to do with the short or failure of the crop in that orchard in the year 1943?

Mr. Naus: Objected to upon the grounds, first, that it calls for an opinion that is based in part

(Testimony of Walter E. Packard.)

upon the hearsay mentioned in the previous objection, to wit, conversations that he held with laymen; secondly, that it calls for unsworn hearsay or statements from some German who finally produced something in typewriting, and to the extent that it is based in part upon either of the matters that I mentioned in the two grounds, it calls for hearsay and an improperly founded opinion.

Mr. Moore: I have outlined his entire studies, your Honor, and Mr. Naus picks up one or two and says they are hearsay. I submit this man is qualified as an expert. His observations, his studies, his knowledge, his readings on all these subjects qualify him as an expert to render his opinion to this court whether or not any of the failure of the crop that appeared on the Pista ranch in 1943 was in any way attributable to the cement.

The Court: The objection will be overruled. You may answer.

A. No, in my opinion dust had nothing to do with the small crop on the Pista orchard in 1943.

Q. What, in your opinion, was the cause of it?

A. In my opinion the three causes which I spoke of before were all a factor on the Pista orchard: One of them being the effect of the warm [501] winter and the dropping of buds, second, the effect of the rain upon pollination, and, third, the effect of disease brought about the warm wet weather during the blossoming period.

Q. Mr. Packard, have you any records as to

(Testimony of Walter E. Packard.)

what the average sales price of fruit was throughout the State of California in 1943? A. Yes.

Q. What record is that?

A. There is a record prepared by Mr. R. E. Blair, agricultural statistician of the California Crop and Live Stock Reporting Service of the United States Department of Agriculture, and the State of California, cooperating.

Mr. Moore: I will ask that this be marked for identification.

Mr. Naus: Merely for identification, I take it.

(The document was marked Defendant's Exhibit X For Identification.)

Mr. Moore: I will offer it in evidence.

Mr. Naus: If the Court please, objected to as an offer of hearsay. An inspection of the document will show that it is not an official report, at all, but is simply a letter that some gentleman has written to Mr. Packard September 9, 1944, and therefore is nothing but hearsay.

Mr. Moore: I think it is admissible, your Honor. However, if necessary I will withdraw the offer for admission and offer it for identification and have Mr. Blair come down here to identify these figures, if necessary. It is from the United [502] States Department of Agriculture and from the State of California Department of Agriculture, an official organization, signed by R. E. Blair, Agricultural Statistician. Now, if Mr. Naus forces me to bring this gentleman down from Sacramento—

(Testimony of Walter E. Packard.)

Mr. Naus: I am not forcing you to do anything, Mr. Moore. As a matter of fact, he starts out his letter by saying, if the Court please—here is a Mr. Blair writing to Mr. Packard—

“Dear Mr. Packard:

“Pursuant to our conversation of September 8th, I found there is no government publication,” and so forth and so on. Please. I am addressing his Honor.

Mr. Moore: Oh, go away.

Mr. Naus: Please, please. Then he proceeds to state some hearsay to him, and, if the Court please, it has to do with the statewide average simply by year—the whole State, all regions—and has nothing to do with any particular region or with the market at any particular time.

Mr. Moore: We propose to show, your Honor, and if necessary we will bring Mr. Blair down here, that the general price for fresh apricots throughout the State was \$132 a ton; that Mr. Pista, for his fruit, as shown by his deposition, got \$152 a ton, because there was some evidence offered here to show that he was getting a lower price for his fruit, and so far as his dried fruit was concerned he got \$108 a ton, while the average price was \$116. In other words, the average price was slightly [503] higher, and we expect to prove likewise the reason why his dried fruit drew a lesser price was not dust, but was green mold coming from the tray boxes where it was dried. I will

(Testimony of Walter E. Packard.)

re-offer it for identification and I will ask Mr. Packard this question:

Q. From a study of that information can you tell us what the average price throughout the State was for fresh fruit in the year 1943?

Mr. Naus: Objected to upon the following grounds: No. 1, it calls upon a witness to give the price of apricots in a particular year with no foundation to show that he had any personal familiarity with the market; and secondly, in so far as he is asked to look at an exhibit for identification and say what it shows, the question in that form calls upon him to give hearsay.

Mr. Moore: I submit it, your Honor.

The Court: Q. Do you know of your own knowledge the price? A. Yes, sir.

Mr. Moore: Q. How do you know it of your own knowledge, Mr. Packard?

A. I took a box of the apricots from Mr. Pista's orchard and went to canning companies, asking what price they might pay for those cots.

Q. Where did you get those cots?

A. From Mr. Pista.

Q. What price did they tell you they would pay for those cots?

Mr. Naus: One moment. Objected to as calling for hearsay, and upon the further ground taking one box, walking around, and [504] holding conversations does not establish any market.

The Court: It does not establish a market, but it goes to the weight of the testimony. I will allow it.

(Testimony of Walter E. Packard.)

Mr. Moore: Q. What was the price offered?

A. The price that the cannery in Gilroy said they would pay was \$110, which was approximately \$10 above the ceiling. At that time I went through the cannery and saw the class of cots that were being canned, and in my judgment the apricots I brought there in that lug box were much superior to the average run of the cannery that I saw while I was there.

Q. Did you have occasion at the time of the harvesting season to observe the drying of Mr. Pista's fruit, that portion that was dried? A. Yes.

Q. Will you describe the drying trays and the manner in which it was dried?

A. Yes. The cots were dried just the same as they are dried on other ranches. The fruit was cut, placed on trays, the trays were placed in the open. They were later sulphured and put in the open, piled up for curing. The same process occurred on other properties, so far as I could see. I saw these trays of cots being dried in the field. I observed them rather carefully, and I found that there was quite an infection of a green mold on the cots that destroyed a good many, which Mr. Pista threw away. I did not see the dried cots being sold, but I assume that some of his green mold, the cots carrying the green mold were carried over into the portion [505] of the crop that was offered for sale.

Q. Did you take any samples of those cots covered with green mold? A. Yes.

(Testimony of Walter E. Packard.)

Q. Have you that sample? A. Yes.

Q. Will you produce it?

(The witness handed object to Mr. Moore.)

Q. I will hand you this envelope with the cots in it. Are those taken from the drying trays of Mr. Pista by yourself in the harvesting season of 1943? A. Yes.

Q. Are those the ones that you referred to a moment ago? A. Yes.

Q. Will you take two or three out of there that have this mold on them?

(The witness did as requested.)

Q. You have handed me three cots. Can you identify the mold so that it can be distinguished? Point it out.

A. Yes, the green mold covering over the cots.

Mr. Moore: We will offer these three in evidence.

(The apricots in question were marked Defendant's Exhibit Y in evidence.)

Mr. Moore: Q. Mr. Packard, what causes this green mold, if you know?

A. This green mold was caused by a fungus that is quite common on apricot trays.

Q. Is there any preventive for it?

A. Well, there is no preventive, but the trays should be thoroughly washed with hot water in order to have the trays free from this mold and from the [506] spores that cause it.

Q. That was before the drying season?

A. Yes.

(Testimony of Walter E. Packard.)

Q. And if the trays are properly washed would it prevent the green mold? A. Yes.

Q. In other words, the green mold is the result of—

Mr. Naus: Who is testifying now?

Mr. Moore: Just a minute. Will you read that last question?

(Record read.)

Mr. Moore: Q. —of the improper washing of the trays, is it?

The Court: You may state whether or not it is.

A. It was due to the fact that the trays were not washed, I think; that is as far as I know.

Mr. Moore: Q. Mr. Packard, there has been introduced here in evidence the Anderson report. You have examined that, have you? A. Yes.

Q. In that report which has been offered but not read, Mr. Anderson, by a series of Experiments, reaches the conclusion that calcium is a caustic agent and that it will cause the prevention of pollination, and in that he quotes from an earlier article by Prof. Beech, which in turn says, or is to the effect that Bordeaux mixture will likewise prevent pollination, the use of it. I will ask you as an expert, do you agree with that particular article in all respects? A. No. [507]

Q. Will you point out wherein your disagree?

A. I disagree with the Anderson article in that it draws conclusions from one series of observations during one year when other evidence by other scientists contradict the conclusions that are drawn by Mr. Anderson. In the article Mr. Anderson

(Testimony of Walter E. Packard.)

does not state all the conditions that surrounded this particular observation in the field. His laboratory studies are very definite, and I think they were right without doubt: that pollen placed in an alkaline solution will be killed. But I do not believe that dust blowing from a mill, such as the mill of the Permanente Metals Corporation, blowing, as it does, in the Natividad area, will have any effect, whatever, on pollination. The experiment here could be compared, I think, quite well with one of the series of observations made by other professors of Cornell University where in some cases the trees that were sprayed yielded more fruit than trees that were not sprayed, and in other cases less. Their conclusion over a much wider experiment with Bordeaux spray and other materials is that you can draw no conclusion whatsoever regarding this.

Q. What do you mean by "this"?

A. What is that?

Q. You said you could draw no conclusion whatsoever regarding "this".

A. That the spraying of orchards during the blooming period would reduce the setting of fruit.

Q. You referred to other articles by Cornell professors on the same subject. A. Yes.

Q. Are you referring to this Defendant's Exhibit U by L. H. MacDaniel and E. L. Hildebrand, of Cornell University? A. Yes.

Q. Is that earlier or later than the—

A. Later.

(Testimony of Walter E. Packard.)

Q. Do you know whether or not it makes any comment on that particular experiment there, or not? A. I think it does. I am not sure.

Q. I do not know, either.

A. I do not recall that it does.

Q. Calling your attention to the article published by the University of California, can you state what result that reached as compared with the experiment conducted by Mr. Anderson?

A. The conclusion here is contrary to the conclusion reached by Mr. Anderson.

Q. You said the laboratory test Mr. Anderson made. Just what do you mean by that? Will you explain?

A. Yes, he took some pollen grains and put them in a solution that was known to be alkaline and they did not germinate. Other pollen grains were put in a normal acid solution similar to the viscous material on the stigma of the flower and they did germinate, and he rightly draws the conclusion that if the solution in which the pollen falls becomes alkaline, that the pollen will not germinate.

Q. Do you think there is any distinction between a laboratory test and a field test?

A. Yes.

Q. In what respect?

A. There are a number of respects in which they are different. In the first place, it is very unlikely [509] indeed that any spraying or any dust coming from a plant would light on the very small area of a pistil in sufficient quantity to cause all

(Testimony of Walter E. Packard.)

of the viscous material on the stigma to become alkaline and therefore kill all the pollen grains that might have fallen on it. In addition, the surface of the stigma is not smooth and shiny. It is rough. There are papillae, little branches which are formed all over the surface of the pistil, and the pollen grain in a sense falls down into the interstices between these papillae and are protected by them. Scientists have found it is rather difficult under those circumstances to get caustic materials into that area so that it will cause the dropings of the bloom if they want it to drop.

Q. In other words, the two conditions are entirely dissimilar, is that it?

A. Yes. Another point is, of course—well, I have finished. [510]

Q. In your opinion would you say that the Anderson opinion would be applicable to the conditions that existed at Permanente and the Pista ranch?

A. Judging from the description and the facts presented in the Anderson report, I would say No, that they were not wholly similar.

Q. What conclusions did you reach from your observation of the fact that the dust on the trees on the Pista ranch and the yield with respect to the trees, whether it was heavier or lighter on the side towards the plant or away from the plant? I believe you testified they were equal. What conclusion did you draw from that relative to the effect, if any, from the dust?

(Testimony of Walter E. Packard.)

A. In Mr. Anderson's report he recites the fact that under those conditions there was a lighter setting of fruit on the side of the trees toward the mill, which got the direct blast of the dust and wind from the mill. I tried to find out—I observed the trees on the Pista orchard and also on the Anderson orchard to find out whether or not I could see any difference in the setting of trees on the different sides of the tree and I was unable to find the same condition in either of those orchards that Mr. Anderson reports there.

Mr. Ewert in his report and study says that he does not understand the Anderson conclusion, but assumes that perhaps in that case, because the volume of the dust was so much greater than reported in other experiments, the stigma may have been covered completely and there was a chemical [511] interference with the falling of the pollen.

At least I have this surmise, that perhaps during the pollinating period in that experiment there may have been a driving rain that occurred in that same direction, because there was a prevailing wind, and that driving rain caused a condition that was somewhat similar to the condition that caused the dropping of the buds in the Pista orchard in 1943, and that that may have been the cause of the dropping of buds on that side rather than the dust.

Q. I am going to phrase it again, if you will. Did the fact that the yield on both sides of the trees was approximately equal at the Pista ranch, and there was not a lesser amount on the side toward the

(Testimony of Walter E. Packard.)

plant than on the other side, did that indicate to you in any way, or is it your opinion that that indicates that the loss of yield was not due to the dust?

A. Yes, that is one of the indications.

Q. The fact that the trees that were more heavily dusted than the others had a better yield, does that have any indication to you as to whether or not the dust had any effect on the Pista orchard?

A. Yes.

Q. What does it—

A. It indicates that since the trees that were in the area that did receive somewhat more dust than trees in other areas, and produced more fruit than those other trees that received less dust, that it was not a factor; I found no relation between the presence of dust and the yield, [512] and he observed the same thing that Mr. Lewis did, that the third blooming did set. It set under the same conditions of dust, but the climatic conditions during that period were very, very different, and I drew the conclusion that it was the change of climate that enabled the trees to set fruit rather than any change in the dust condition, since there was no change.

Q. Were you there during the pollination period in 1944? A. Yes.

Q. Was there any dust at that time?

A. Yes.

Q. Of course, you were not there during 1943 during the pollination period, so you can't compare the amount of it, can you? A. No, sir.

Q. But there was some dust? A. Yes.

(Testimony of Walter E. Packard.)

Q. During the pollination period did you observe the blossoms, the settling of the dust and its effect upon the blossoms with respect to pollination?

A. I observed the conditions. I saw no effect of dust on the blossoms at all this year.

Q. You went there for that purpose, did you?

A. Yes.

Q. You did see dust there? A. Yes.

Q. But you saw no effect of it on the fertilization or pollination of these cots in 1944, in that correct?

A. Well, neither I nor anyone else could see the effect of dust on the tree, but I observed the general condition of the tree and drew the conclusion that there was no effect. Nobody could look at the blossom and see the dust and say this or that [513] effect, but observing that orchard in general I could see no effect that might have resulted from the dust.

Q. Did you observe the blossoming? Was it a scanty blossoming, a full blossoming, or how could you describe it?

A. The blossoming covered quite a long period. It covered a period of nearly three weeks, as I recall it.

Q. I am talking about 1944 now.

A. Yes, it covered a rather long period, and the trees therefore showed some bloom, during the very beginning of March, the early part of March. Then it gradually got more and more, and perhaps the fuller bloom came along about the 17th of March, and still some days after that there were

(Testimony of Walter E. Packard.)

still blooms coming out on the trees in the Pista orchard.

Q. Did you notice any dropping of little cots in the 1944 season—I mean at the time of the pollination?

A. No, I did not. I saw there was a very pronounced dropping of leaf buds due to a warm winter this past winter, but I did not observe and dropping of the fruit buds.

Q. When did you visit the orchard again after the pollination period?

A. I visited in April, again in May, and again in June.

Q. In the month of May I visited the orchard with you, did I not? A. Yes.

Q. What was the condition of the trees on the date on which we visited the orchard?

A. The trees were producing cots. The [514] cots were then growing on the tree. They were small, a little bit larger than a marble.

Q. Were they heavily laden? A. Very.

Q. Did you notice whether any of the trees had been thinned out? A. Yes.

Q. Were quite a number of them thinned out?

A. Yes.

Q. Did you take a fairly representative tree to determine the extent of the thinning out on that tree? A. Yes.

Q. Will you describe what you found?

A. I took a tree near the house, and I counted the number of cots that were on the ground under

(Testimony of Walter E. Packard.)

that tree in a pie-shaped area representing one-eighth, as nearly as I could judge, of the entire area under the tree. I tried to pick a representative area, although the cots on the ground seemed to be rather evenly distributed, and in that one-eighth we picked up 802 cots, which is 6,400 cots per tree, or a yield of about 20 tons per acre based on an acreage basis that we found on the ground under that tree.

Q. The other trees were laden the same, is that correct?

A. No, some had more, I should have judged, and others had less. There were some trees that were not thinned.

Q. From your observation, then, probably the 1944 crop was so heavy that they had to thin it out perhaps to the extent of 20 tons, is that correct?

A. Oh, I should judge that they thinned it out to an extent of considerably in excess of 20 tons potentially. That was 20 tons for one tree. If those 6,400 [515] cots had remained on the tree and had developed into cots of 12 to a pound, those cots would have weighed about 20 tons.

Q. In other words, the orchard required that amount of thinning because of the heavy yield?

A. Yes. Many branches broke off because of the heavy crop, because they were not thinned enough.

Q. Did that yield indicate to you in any way whether this dust had any effect on the trees so far as their yield was concerned?

A. Yes, it did. It indicated that the dust that was present this year had no effect whatever, no more than it did last year.

(Testimony of Walter E. Packard.)

Mr. Moore: I think that is all, your Honor, at this time.

Mr. Naus: Shall I proceed now?

The Court: Is there no hope of getting through with this witness tonight?

Mr. Naus: I do not see how, if we kept on now, we could do it before an hour and a half to two hours.

The Court: What other witnesses have you?

Mr. Moore: That concludes our witnesses, your Honor.

Mr. Naus: I will have two and perhaps—I say only perhaps—three short witnesses.

The Court: Would we be able to conclude tomorrow morning or, in any event, tomorrow?

Mr. Naus: We might conclude in the morning, certainly tomorrow.

The Court: We will put the matter over to tomorrow.

(Thereupon an adjournment was taken until tomorrow, Thursday, September 21, 1944, at 10:00 a.m.) [516]

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Thursday, September 21, 1944,  
10:00 o'clock a.m.

The Court: You may proceed, Counsel.

Mr. Moore: At yesterday's hearing, your Honor, various statistical data was introduced, various exhibits offered which were marked for identification

rather than in evidence. With respect to Exhibit N, which is deciduous fruits statistics from the University of California, an entire book was marked Exhibit N for identification. The page that we are offering, to get the record clear, is page 42 of that particular record.

The temperature record and various other rainfall and weather records were marked for identification because Mr. Naus stated that he wanted an opportunity to check them. I just spoke to him and he said he had not had an opportunity yet to check them, and I want to give him that opportunity, but I do not want by any error to overlook offering those in evidence. The reason I am not making the offer at this particular time is because of Mr. Naus' statement that he desired to check them.

Mr. Naus: As to the weather records, if the Court please, I told Mr. Moore I had not had a chance to examine them. They were in the custody of the clerk. I might say after the adjournment of court yesterday, some little time afterwards, it appeared it might be well for me to withdraw some exhibits and look at them overnight. Mr. Welsh, when I made the request [517] of him, said you had left, and I thought it best not to withdraw any exhibits in your absence, and without your permission. I did not withdraw them for that reason.

Page 42 of Exhibit N, that statistical record, needs no examination from me. I would suggest that you have the witness, or someone—presumably the witness—lay a slight foundation by saying who put the pencil handwriting and who put the ink

handwriting on that mimeographed page. So far as the mimeographed matter is concerned, I make no objection, but I would like to identify the source of that.

Mr. Moore: Surely.

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WALTER E. PACKARD,  
recalled;

Direct Examination (resumed)

Mr. Moore: Q. Mr. Packard, calling your attention to the penciled memorandum on this mimeographed record, in whose handwriting is it?

Mr. Naus: That is page 42.

Mr. Moore: That is page 42.

Mr. Naus: Exhibit N.

The Witness: That is mine.

Mr. Naus: There is some ink writing, too.

Mr. Moore: Q. And the ink writing is in your handwriting?      A. Yes.

Q. From what source did you get the ink writing?

A. I got it [518] from two sources, both reports of the State Department of Agriculture, one giving the acreage and the other giving the yield.

Mr. Moore: I offer it in evidence.

Mr. Naus: Page 42 of Exhibit N, is that correct,

Mr. Clerk?

Mr. Moore: That is correct.

(Page 42 of Exhibit N was received in evidence and marked Defendant's Exhibit N-1.)

## DEFENDANT'S EXHIBIT N-1

University of California, College of Agriculture  
 Agricultural Experiment Station, Berkeley, January, 1943

File #1216  
 11.7122

## DECIDUOUS FRUIT STATISTICS

## APRICOTS

Table 1. Washington and Utah Production and California Production, Yield, Acreage, and Farm Value of Apricots, 1919-1942.

Crop year	Production			California			
	Utab	Wash. <sup>2</sup>	Calif. <sup>2</sup>	Yield per bearing acre	Bearing acreage <sup>3</sup>	Price to growers per ton	Total returns to growers
	1	2	3	4	5	6	7
1,000							
Short tons				Tons	Acres	Dollars	Dollars
1919	4	4	170,000	3.7	46,100	87	14,790
1920	.....	.....	107,000	2.2	47,907	87	9,303
1921	.....	.....	97,000	1.7	56,407	56	5,432
1922	.....	.....	160,000	2.6	60,754	76	12,160
1923	.....	.....	209,000	3.4	62,287	31	6,479
1924	.....	.....	136,000	2.1	64,189	52	7,072
1925	.....	.....	149,000	2.2	66,855	61	9,089
1926	.....	.....	173,000	2.4	72,107	68	11,764
1927	.....	1,700	206,000	2.6	79,260	57	11,742
1928	.....	4,300	173,000	2.1	82,703	51	8,823
1929	1,900	6,500	212,000	2.6	82,136	64	13,568
1930	800	3,600	194,000 warm*	2.4	81,448	39	7,215
1931	1,000	6,000	274,000	3.4	80,543	29	7,830
1932	1,750	4,800	266,000	3.3	81,534	18	4,554
1933	800	2,300	263,000	3.4	79,596	30	8,040
1934	3,400	11,300	139,000 warm*	1.8	78,795	54	7,506
1935	1,700	9,800	216,000	2.7	80,000	46	9,936
1936	1,800	7,200	248,000	3.4	73,773	38	9,424
1937	1,650	11,800	311,000 cold*	4.2	74,756	37	11,507
1938	4,900	14,500	166,000	2.3	73,571	35	5,810
1939	5,200	14,300	312,000 cold*	4.3	73,319	33	10,032
1940	7,500	16,300	103,000 warm*	1.5	70,881	53	5,459
1941	1,300	14,600	198,000	2.9	69,257	45	8,910
1942	3,100	17,100	204,000	3.0	68,500	69	13,731
			80,000 warm*	1.16*	68,528*		
				67.36*			
				10*			

<sup>1</sup> Returns for naked fruit at growers' first delivery point.

<sup>2</sup> Includes unharvested tonnage: California—1930, 9,000; 1931, 4,000; 1932, 13,000; 1939, 8,000; and 1942, 5,000. Washington—1934, 200; 1935, 1,200; and 1938, 2,200.

<sup>3</sup> Nonbearing acres: 1936, 4,836; 1937, 5,044; 1938, 5,388; 1939, 5,052; 1940, 4,732; and 1941, 3,932.

<sup>4</sup> Leaders indicate data not available.

<sup>5</sup> Preliminary estimates.

Sources of data: Compiled by S. W. Shear, Giannini Foundation of Agricultural Economics, University of California, from latest reports of the United States and California Crop Reporting Services, except cols. 4 and 7 calculated.

[Printer's Note]: \* In longhand.

[Endorsed]: Filed 9-21-44.



(Testimony of Walter E. Packard.)

Mr. Moore: The other is marked for identification, and the balance of the offer that was marked for identification I will withhold.

Mr. Naus: So far as the weather records are concerned, I have no objection to the weather records being received in evidence subject to my checking it subsequently and calling any proper correction or necessary correction to your attention and to his Honor's. If I had examined it overnight I would have done it, but even if it is received in evidence I could still correct it.

The Court: Let it go in subject to any correction he desires to make.

Mr. Naus: I take it, if the Court please—I do not want to anticipate anything—but I take it, in view of the nature of the case and the issues involved, perhaps your Honor will want briefs from counsel. If it turns out that way, if it is to be briefed, then in the course of the briefing I could telephone Mr. Moore or your Honor about corrections, if any be needed. [519]

Mr. Moore: No further questions.

#### Cross-Examination

Mr. Naus: Q. Mr. Packard, as I understand it from your testimony, your original entry into the agricultural field as a trained man was in Iowa?

A. Yes, sir.

Q. Did you have any personal or first-hand experience with apricots in Iowa? A. No, sir.

Q. And then you came to California and studied

(Testimony of Walter E. Packard.)

at the University of California in the agricultural branch? A. Yes.

Q. In the course of that study, did you make any personal study of apricots beyond reading books? A. No.

Q. Then the next ten years you were superintendent of an Imperial Valley Experiment Farm, is that correct? A. Yes.

Q. What years of the calendar were those?

A. Those were 1910 to 1917 and the other three years I was in the extension service.

Q. Now, the seven years on the experiment farm, were there any apricots down in the Imperial Valley Experiment Farm? A. Yes.

Q. Were they in commercial bearing?

A. We had several varieties. We were trying it. They were not commercial plantings—no commercial plantings on the experimental farm.

Q. Then in that seven years, I take it, you had no first-hand experience in the commercial production of apricots? A. That is right.

Q. Then the next three years following those seven were spent [520] where?

A. Part of it in France, part of it in Harvard University, and part of it in California.

Q. In those three years did you have any first-hand or personal experience in the commercial production of apricots? A. No, sir.

Q. Or the observation of the commercial production at first hand? A. Yes.

Q. When and where?

(Testimony of Walter E. Packard.)

A. In the San Joaquin Valley. I was in charge of a land settlement project there, and some of the settlers had apricots growing, and I was in general their adviser on problems of raising the crops that they were raising.

Q. In those three years of land settlement project were any of the apricot trees in commercial bearing? A. No, sir, they were not.

Q. They were just little home trees?

A. No, they were commercial orchards but they were just planted. They were not in bearing.

Q. Then you were next where?

A. I was next serving as a consultant for various agencies in California and in Mexico.

Q. Down in Mexico did you have any first hand or personal experience with the commercial production of apricots? A. No, sir.

Q. And the occasional intermissions of the Mexico experience when you were in California, did you have any first-hand or personal observation of the commercial production of apricots?

A. Yes, sir.

Q. When and where?

A. I was handling the property that had been [521] taken over by mortgage by one of the insurance companies, and that included one apricot orchard of about twenty acres or so—about twenty acres as I recall it—in Riverside County.

Q. That was a sort of a business management, was it? A. Yes.

Q. For how long?

(Testimony of Walter E. Packard.)

A. For a period of two years.

Q. How many acres of apricots, did you say?

A. I think about 20, as I recall it.

Q. Were they in commercial production?

A. Yes.

Q. What was the period of blossom time down in Riverside County of apricots?

A. It varied as it does in other parts of the State, but in general it was the first part of March.

Q. From when to when?

A. Generally, from the 1st of March until the 15th of March.

Q. Over about two weeks?

A. Yes, on the average; some years longer and some years—two to three weeks would cover the blooming period.

Q. What was the age of those trees during the two years that you were there?

A. As I recall it, they were about fifteen years old, but I can't remember exactly.

Q. That is close enough. Now, in those two years you were down in Riverside County, or was it near the town of Riverside?

A. No, it was in the county, not very near the town of Riverside.

Q. What is the locality name?

A. It has no locality name. It [522] was in the country up a canyon southeast of Riverside, perhaps twenty miles.

Q. Down in that area did you ever have any experience with rainfall on apricot blossoms?

(Testimony of Walter E. Packard.)

A. No, sir.

Q. Next after leaving there, tell me what first-hand or personal experience you had with the commercial production of apricots or the first-hand or personal observation of it since your Riverside experience?

A. Yes. I observed the production of apricots in the Clayton Valley.

Q. Where?

A. In the Clayton Valley in Contra Costa County. Those orchards were receiving dust from the Cowell-Portland Cement Company plant there, and I observed those over a period of two years.

Q. What years? A. 1931 and 1932.

Q. Have you now stated all of your first-hand or personal experience since your Riverside experience? A. How is that?

Q. Have you now stated all your first-hand or personal experience subsequent to the Riverside experience?

A. No. I do have apricot trees in my backyard —one apricot tree in my backyard that I have closely observed.

Q. Have you now stated all your first-hand or personal experience? A. Yes.

Q. In Contra Costa County did you observe the trees during blossom time? A. Yes.

Q. Did it rain during that time?

A. I do not remember whether [523] it did or did not.

Q. Mr. Packard, can you tell me whether at any

(Testimony of Walter E. Packard.)

time in your life you ever observed a commercially-producing apricot orchard during blossom time, with rainfall upon it during that time?

A. No, not that I recall.

Q. Then as a matter of fact, anything you said upon direct as to the effect of rainfall upon apricot blossoms was not based upon any personal observation or experience of your own, was it?

A. No, sir.

Q. Now, I understand you were employed by Permanente beginning about or on the 2nd day of July, 1943; have I got that right? A. Yes.

Q. And you have been steadily employed by them since?

A. Only occasionally, just a day at a time through the period—only sometimes a day, sometimes at no time during the month.

Q. Was the employment on a per diem or fee basis? A. It was on a per diem basis.

Q. Was the purpose of your employment addressed to dust damage or the absence of it, connected with the Permanente plant at Natividad?

A. Yes.

Q. Something has been said through this case and also in the course of your direct examination about this statewide depression of the apricot production of California down to about 20 percent. You recall that? A. Yes.

Mr. Moore: You mean in 1943. [524]

Mr. Naus: Q. In 1943, I meant. You recall that, don't you, Mr. Packard? A. Yes.

(Testimony of Walter E. Packard.)

Q. That is 20 percent of what?

A. I think the figure of 20 percent is not exact. I do not think I gave that figure.

Q. I agree with you. What I am trying to get *it*, first of all, is what do you apply the 20 percent to as a basis? 20 percent of what?

A. I didn't use 20 percent, but whatever percentage there is was a percentage over a 25-year period of production of apricots in California.

Mr. Naus: Have you that exhibit, Mr. Moore, that you borrowed back from me, that Exhibit N?

Q. That period you speak of is at the period reflected by Exhibit N-1, being page 42 of Deciduous Fruits Statistics?

A. Yes, sir; yes, sir, it is.

Q. I notice in the first instance that is not a 25-year period, you mean from 1919 to 1943, both inclusive, don't you? A. Yes, approximately.

Q. When you attempt to apply what percentage 1943 is of something else, you take the period 1919 to 1942, both inclusive, don't you?

A. I would if I were asked that question, yes.

Q. That is the base that you have in mind when you talk percentages isn't it?

A. I haven't talked percentages yet, but if I were asked that, that would be the basis of it, yes, sir.

Q. I notice in looking at page 42 there is one column that shows [525] the total tonnage of apricots year by year produced in California.

A. Yes, sir.

(Testimony of Walter E. Packard.)

Q. And there is another column alongside of that that shows the number of commercially bearing acres from which that tonnage was taken.

A. Yes, sir.

Q. So for the purpose of comparison, the true or weighted comparison would be the tons per acre produced each year, would it not?

A. Yes, sir.

Q. When you say you take it over that period of 25-odd years, you mean take the average of that period, don't you? A. Yes.

Q. What was the average production in California during the years 1919 to 1942, both inclusive, in tons per acre?

A. You would have to let me add this up and divide it.

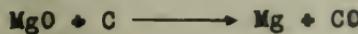
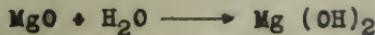
Q. It can be done very quickly. Will you do it, please? A. Yes, sir.

Mr. Naus: If the Court please, in that connection I asked the court reporters this morning to be good enough to copy off in their notes both sides of the blackboard used here so far, and I understand they have done that, and with that understanding may we have the blackboard erased for the purpose of further figuring, with the understanding that the reporter at this place of his daily transcript will transcribe or copy in there everything that appears upon both sides of the blackboard?

The Court: No objection?

Mr. Moore: No objection. [526]

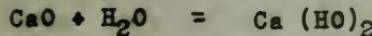
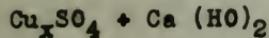
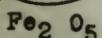
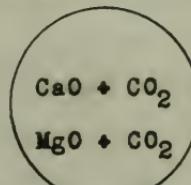
1 (The following appeared on one side of the blackboard:)



8 (See Dr. Duschak's testimony, Page 191)

9

10 (The following appeared on the reverse side of the blackboard)



24

25 (See Mr. Twining's testimony, Page 220)



(Testimony of Walter E. Packard.)

Mr. Naus: What was the answer to my question?

The Court: Per acre.

Mr. Naus: Yes, per acre.

Mr. Moore: I make no objection, your Honor, except that it be checked with an adding machine.

Mr. Naus: Why, surely. It is all arithmetical.

The Witness: The average for the 25 years in question is 2.69 tons per acre.

Mr. Naus: Q. Did you include 1943 in that?

A. Yes, sir.

Q. I know, but excluding 1943. I want to get the average to apply a percentage to.

A. Yes. Well, I shall get that, then.

Q. I think it will be about 2.9 or thereabouts.

A. 2.75 tons per acre, as I get it.

Q. 2.75? A. Yes, sir.

Mr. Moore: Pardon me, Mr. Naus, can't you leave that so I can see it without looking over your shoulder at the witness and cutting off my view entirely?

The Court: I never thought either one of you was so temperamental.

Mr. Naus: I wanted it so both your Honor and the witness could see it.

The Court: I will scold both of you. Proceed.

Mr. Naus: Q. Mr. Packard, what was the state-wide average in tons per acre of commercially-bearing apricot acreage in the year 1943?

A. 1.16. [528]

Q. Mr. Packard; is it or not the fact that in

(Testimony of Walter E. Packard.)

1943 the apricot production statewide in California was 42 percent of the statewide average over the preceding 24 years? A. Yes, sir.

Q. Now, in tons per acre, the production in Monterey County far exceeds the statewide average, doesn't it, with respect to apricots?

A. The production of apricots in 1943 was less per acre in Monterey County than the statewide average.

Q. Let us exclude 1943 and take it generally. Isn't the production in tons per acre in excess of the statewide average? Isn't it above?

A. I can't answer that without looking at the record. I do recall I figured for 1943 and it was lower then. I have the record that I can look up, if you care to, but I can't answer it without seeing the record.

Q. In your study of the Pista orchard you ascertained, did you not, that in 1944 and preceding years it had no more than 44 acres in commercial bearing?

A. Could you ask that question again? I did not quite get it.

(Question read.)

A. No, sir, I did not.

Q. How many acres did it have in commercial bearing?

A. According to my estimate there were about 35 acres in bearing in 1943 and in prior years. I would presume that the acreage was much in excess

(Testimony of Walter E. Packard.)

of that because of the area of replants where the trees had been killed by oak root fungus; I had presumed they were bearing trees prior to that time. So that the acreage [529] in prior years was greater than the acreage in 1943. During that year several trees died. I think at least 25 have died from oak root fungus since I have watched the orchard, so I presume in prior years the acreage was larger.

Q. What was the acreage in 1944, the commercially-bearing acreage of apricot trees on the Pista orchard in the year 1944?

A. I should say 25 trees less than there was in 1943, when I estimated it to be about 25 acres.

Q. 25 acres would be about a third of an acre less, wouldn't it? A. Yes.

Q. What do you understand the production in tons per acre of the Pista orchard in 1944 to have been?

A. I do not recall the figure. I think the figure is in evidence, but I do not recall exactly what it was.

Q. Well, the figure is 450 tons, so down in this Natividad area you get a production of around 13 tons per acre, from your figures, don't you, in good years? A. In that one year, yes, sir.

Q. Isn't that, or, nearly five times the statewide average over the years?

A. Yes, nearly five times.

Q. Then I ask again, can you or not tell me, as an apricot expert, if there is any locality in Cali-

(Testimony of Walter E. Packard.)

fornia that has a higher yield of apricots per acre than in localities in Monterey County?

A. Yes.

Q. Where?

A. I think that the records show that the orchards in Santa Clara County bear heavier than the orchards in Monterey. [530] I think the records show that the orchards in San Benito County bear heavier. I believe that the records show that the apricots up near Winters bear heavier than Monterey County. I think Monterey County in general is rather a disadvantaged area for the production of cots, because of the prevailing fog that is so common in that county.

Q. What would you estimate the average production of the Pista orchard to have been prior to 1943?

A. The records are on file from 1939 to 1944, and if I may examine the records, I will be glad to answer it for that period.

Q. In all these investigations that you made for Permanente that ended up in rather filling your briefcase, have you assembled those records? Have you studied them?

A. I have not assembled them, but Mr. Pista made a statement which I have that does give them, and I have studied them.

Q. Will you turn to them, please?

Mr. Moore: It may be stipulated, may it not, Mr. Naus, that the figures which he is examining are copies of an exhibit of Mr. Pista's own figures

(Testimony of Walter E. Packard.)

that are attached to his or his son's deposition, is that correct?

Mr. Naus: I have not examined what is attached to the deposition, but I assume it would be correct if I looked at and see what you have in mind.

Mr. Moore: I want to show the source of the figures.

Mr. Naus: There is no question about the source. I would [531] rather proceed with the cross-examination, however.

Mr. Moore: I want to be sure, so it is understood, these are figures produced by Mr. Pista in the deposition taken.

The Court: The witness has so testified on the stand.

Mr. Naus: Q. I am asking you, Mr. Packard, what your investigation disclosed to you as the average production of apricots from the Pista orchard prior to the year 1943.

A. In 1937 the production was—

Q. I am not asking you year by year; I am asking you what you understood to be the average; you may have used these years; you may have used others. I do not care what years you used. I am only asking you what your investigation disclosed to be the average annual production of apricots before the year 1943.

A. May I add these figures again?

Q. Surely. A. Approximately 10 percent.

Q. I am asking you about the average annual production of an apricot orchard. I do not know

(Testimony of Walter E. Packard.)

how an orchard produces percent. I am speaking about production of apricots.

A. Excuse me. I missed the question.

Q. What was the average annual production of apricots from the Pista ranch before the year 1943?

A. 266 tons per acre. . .

Q. Now, you do not mean that.

A. I mean tons—excuse me—tons per year.

Q. How do you translate that into tons per acre?

Will you do that? [531]

Mr. Moore: That is assuming the 35 acres, Mr. Naus, exist.

Mr. Naus: I am addressing the witness, Mr. Packard, who is put on by you. He brought in maps of the area. He is talking as an expert, one who has had it under observation, and one who has inspected it. If the witness' answers on cross indicate that he has been in error somewhere or loose in his estimates or the like, I do not think he should be given hints during his cross-examination.

Mr. Moore: I am not giving hints. I am objecting to the question as assuming facts contrary to the evidence. Mr. Packard testified that from his examination of that orchard and the replants he was of the opinion that in past years it had a greater acreage than it had in 1943. Now, we can get from Mr. Pista or somebody how many trees or acres he did tear out—in other words, no accurate estimate can be made here unless we know when those trees were taken out. If you want to use the 35 acres that Mr. Packard says now, I am not going

(Testimony of Walter E. Packard.)

to object to it, but I want the question to be understood, your Honor, that it assumes facts contrary to the evidence, that there are trees taken out.

The Court: The record discloses so far that there was a third of an acre taken out.

Mr. Moore: That was between 1943 and 1944.

The Court: All right. If there was two and a third [532] acres taken out, develop the fact, whatever it may be. He has a right to develop his facts as he sees them. If there is any question about it, you develop the fact.

Mr. Naus: If the Court please, you will have in mind no doubt in my question I did not mention number of acres. I left that to the witness.

The Witness: I am ready.

The Court: Read the question.

(The last question was read by the reporter.)

A. You translate it by dividing the total tonnage by the number of acres.

The Court: From 1943 on.

The Witness: The average tonnage.

Mr. Naus: Before 1943.

The Witness: Prior to 1943, without including 1943, dividing it by 35 acres, the average would be 7.6 tons per acre per year. Dividing it by 40 acres, which was the figure given by Mr. Lewis, it would be 6.6 tons. Dividing it by the 44-acre figure which Mr. Pista gave, it would be approximately 6 tons per acre.

The Court: That covers your objection.

(Testimony of Walter E. Packard.)

Mr. Naus: Covers everything that either one of us could think of, I think.

Q. Now tell me, Mr. Packard, laying aside state-wide averages for the moment, what, from your investigation, you found the county-wide production of apricots in Monterey County in the [533] year 1943 to have been in percentage of the average of preceding years?

A. I would have to have the record.

Q. I think you have it right here, haven't you, in this exhibit that you brought into court, Defendant's Exhibit O?

A. That is not given in tons. I would have to change that to tons. That is in boxes.

Q. Well, how many boxes are there to the ton?

A. I think there are about 40 pounds to the box, 50 boxes to the ton.

The Court: Q. That would be in Los Angeles, would it?

A. No, these are 40-pound lugs.

Mr. Naus: Q. Mr. Packard, you mean 40 pounds of apricots or 40 pounds of apricots and box and nails?

A. I got the figure from Mr. Lewis. He said 40 pounds: I presume he meant 40 pounds of apricots in a box.

Q. You presume that. I will tell you it can be proved the weight of apricots is 27 pounds after you subtract the wood, the nails, and so on.

Mr. Moore: Is that a question or an argument with the witness?

(Testimony of Walter E. Packard.)

Mr. Naus: I will withdraw that, but that gives me a thought.

The Witness: You are thinking about a different box.

The Court: That is why I mentioned the Los Angeles lug box.

Mr. Naus: Q. Take the boxes that are in evidence, Exhibit O, the exhibit that you personally brought in here presumably after studying. That refers to boxes. In those statistical boxes [534] that are mentioned there what was the net weight per box used by the statistician?

A. I haven't got that figure. You didn't give me the figures.

Q. Then I will reframe the other question. I will ask you in tons, because we can reach the same percentage in boxes. Take the total production countywide, the total production in boxes of apricots in Monterey County in the year 1943; what percentage is that production of the average of the preceding years in boxes?

A. I will tell you if you will let me have those figures.

Mr. Naus: I am perfectly willing to proceed without any recess. I do not need any. But if the witness is going to figure, perhaps your Honor would prefer to have a recess to enable him to do it.

The Court: Very well.

(Recess.) [535]

Mr. Moore: I suppose, Mr. Naus, it is stipu-

(Testimony of Walter E. Packard.)

lated that all of these computations are subject to check?

Mr. Naus: Oh, surely, surely. Any one of us could figure them. They are necessary as a basis, however, for the result of further examination of the witness.

Mr. Moore: All right.

Mr. Naus: As a matter of fact, I had already calculated them.

Q. Are you ready to proceed, Mr. Packard?

A. I have one percentage yet to figure. I have the figures.

Q. All right. First of all, let us take it a step at a time. The point of the question in substance is: Take the statistically reported tonnage or volume in boxes of apricots produced in Monterey County in the year 1943. What percentage is that of the average production in the preceding years?

A. The average production is, if these figures are right—is 8 percent of the average for the preceding five years.

Q. Well, now, let's see. Have you got the exhibit there? A. Yes, sir.

Q. All right; let's see.

A. I may have made an error. That seems rather low, but that is as my figures came out.

Q. Now, let's see, Mr. Packard. The years are 1938, '39, '40, '41, and '42, and '43, aren't they? No; put 1943 by itself (writing on blackboard).

A. I see where I made my error. For one year I copied off the wrong figure. I am very sorry.

(Testimony of Walter E. Packard.)

[536] I took the figure on the line below. May I just have a second to refigure it? I can refigure it quickly now.

Q. Surely.

A. Approximately 55 percent, as I get it now.

Q. In arriving at 55 percent, what number of tons or boxes, rather, of production did you use for the year 1943 to calculate your percentage?

A. 90,450.

Q. All right. Now, I will tell you in advance where I am heading so you can follow me. Nobody is bound by what I say, but you are going to find that is right. I think I can tell where you fell into error. Your 55 percent—

A. Yes, 55 percent.

Q. —is this, is it not: the fraction for 90,450 above the line to 166,051 below the line; is that how you arrived at it? A. Yes.

Q. Now, let us take a step further. In the years 1938, '39, '40, '41, and '42 the producing acreage was practically 1,853 acres a year, wasn't it?

A. According to these figures, yes sir.

Q. That is all we have to go by; that is what the producing acreage was in the years before 1943, was it not? A. I think not.

Q. That is what the figures show, is it not?

A. Yes, sir. May I explain my reason? I think the acreage was checked in 1943, and the acreage was reduced, and that by going over the actual acreage in the years prior to that time that you would [537] find the error was in those figures

(Testimony of Walter E. Packard.)

rather than in the 1943 figure, which I think was probably right.

Q. All right. Then according to your understanding, if the true acreage for each of the years were taken, you consider that the statistics are in error, do you, with respect to acreage of apricots?

A. Yes. Yes, I do.

Q. But if you take the acreage actually shown on the report, it shows only 1,629 acres in 1943, doesn't it?

Mr. Moore: 1,600 or 16,000?

Mr. Naus: 1,629.

A. 1,600—that is right, 1,629.

Q. Now, the 1,629 acres in the Monterey County figures as reported in the statistics is to the acreage reported for the previous years as 90,450 is to 102,700; correct?

A. That is, if you translated it, yes.

Q. If you take the yield per year in the years preceding 1942 on this lower acreage reported for 1943 you would end up with 102,700 boxes?

A. I presume so, yes. I haven't figured those, but that looks right. It looks right.

Q. Take my word for it. If you want to correct it this afternoon, you may.

A. But it looks right.

Q. Then if you apply that to the average of 166,051 you would then have a weighted or true average according to the statistics of 62 percent, wouldn't you?

(Testimony of Walter E. Packard.)

A. You would get a weighted average, but not a true average, on my assumption. [538]

Q. You would get a weighted average according to those statistics?

A. On your assumption, yes, sir.

Q. I am only assuming the statistics. On the weight of those statistics you end up with 62 percent instead of 55 percent, don't you?

A. Yes, sir, on that assumption.

Q. Assuming the production in Monterey County county-wide as distinguished from the production in California state-wide, why is it that in 1943 the actual production of apricots in Monterey County was either 55 percent or 62 percent, as the case may be, instead of the lower statewide average of 42 percent?

A. It was due to the fact that there are comparatively few orchards in Monerey County, and, as a result, orchards that yielded well represented a greater weighting in the total average. The average production per acre in Monterey County was less than the average production for the State.

Q. What are the dates of harvesting apricots in Santa Clara County?

A. They vary in different years. There is no set date. I think they vary from as early perhaps as the 25th of February on to—including maybe the 18th of March.

Q. Your answer seems to assume that I asked dates of blossoming. My question really was as to dates of harvesting.

(Testimony of Walter E. Packard.)

A. Oh, excuse me. Generally in July.

Q. What are the dates of harvesting apricots in Alameda County? A. In July. [539]

Q. What is the date of harvesting apricots in Contra Costa County? A. July.

Q. You mean the regions all go on the market at the same time with Monterey County?

A. Not exactly. There is some difference, but in general the cots are harvested in July.

Q. What cots?

A. Some come in late in June; some, as this year, come in as late as August.

Q. What region in California puts apricots commercially on the market earliest?

A. I think the region around Hanford in Kings County, but I am not positive; it may be the Winters area.

Q. You were down around the Natividad region in July 1943, weren't you? A. Yes.

Q. Did you spend a good deal of time down there in the month of July?

A. No; I was down there on the 2nd; then I went back on the 6th, and I stayed two days then. Then I was there again on the 10th, and I think I stayed two days then. That would be five days out of the month.

Q. In the year 1943 when was the Bardin apricot crop harvested, over what dates?

A. I don't know.

Q. In the year 1943 when was the Anderson apricot crop harvested, over what dates?

(Testimony of Walter E. Packard.)

A. I don't know what dates covered the entire harvest; they were harvesting in July.

Q. Well, from about when to when?

A. I don't know.

Q. In the year 1943 over how long a period of time, over how [540] many calendar days, did the Bardin harvest extend? A. I don't know.

Q. Over how many calendar days did the Anderson harvest extend? A. I don't know.

Q. The Pista harvest? A. I don't know.

Q. Do you know the dates over which harvesting extended in any apricot orchard in the Natividad or Alisal districts?

A. Not exact dates, no, sir.

Q. You spoke, by the way, of taking one box of apricots from the Pista orchard in 1943. That was given to you, was it? A. Yes, sir.

Q. For the purpose of using as a sample, was it?

A. I don't know. I asked to buy apricots, and Mr. Pista offered to give them to me. I wanted to pay for them. He was very kind indeed and gave me, I think, three boxes all together.

Q. He made you a present of them, didn't he?

A. Yes, he did.

Q. Did you tell him you were going around to the canneries and have them priced?

A. He knew exactly why I was down there. I went over his orchard and talked the whole thing over. I didn't tell him I was going to take the cots to be priced.

Q. I didn't ask you whether you told Mr. Pista

(Testimony of Walter E. Packard.)

why you were down there. I asked you if when he made you the present you told him that you were going to take the boxes around to the canneries and have them priced.      A. No, no, I didn't.

Q. You spoke of taking some samples of dried apricots that had [541] something that looked green on them. When did you get those samples?

A. I think on the 10th of July.

Q. And where did you get them?

A. I got them off the trays.

Q. And who was present when you got them?

A. My wife was present, and I—she and I went down there together, and there was a boy—no, I think she and I were the only ones present when I took those cots.

Q. Did you tell Mr. Pista you were going to take some?

A. He gave me the free run of the ranch. He said, "Just go out and see anything you want; get anything you want." He was very kind indeed and very cooperative, gave me complete freedom to do anything I wanted, and I went out to see the trays with him, and I didn't ask him whether I should take samples or not, but he said, "Just go ahead by yourself and get what you want," and so I did.

Q. Getting back to my question, apparently only you and your wife were present. I merely asked you whether you had told Mr. Pista you were going to take some of the dried apricots out of the trays in his orchard.

(Testimony of Walter E. Packard.)

A. No, no, I did not. I am not at all sure but what he knew that I did it; I didn't try to conceal it at all.

Q. Now, have you ever made any chemical study or analysis of dust from any plant that has fallen on an orchard?

A. No, sir. Well, may I correct that? I would say Yes.

Q. When and where?

A. I made tests in the Clayton Valley [542] in 1931 and '32. I made tests in the Santa Cruz area in 1941, I think it was, and I made tests in the Natividad area in 1943.

Q. When you say "tests," tell me specifically what you mean by a test, what you did, how you tested.

A. I had a bottle of hydrochloric acid, and I simply dropped the acid on dust that I wanted to determine whether the dust was carbonate or not; and if it is carbonate you have a very quick and immediate reaction. And so I carried a bottle of acid with me so that I could distinguish between the dust from the plant and road dust or other dust that might have gotten on the trees.

Q. You mean a bottle of this hydrochloride—that was a liquid, wasn't it?

A. Hydrochloric acid. Yes, it was a liquid, and I had a dropper.

Q. Had you finished? A. Yes, sir.

Q. The bottle you had with you was a bottle of liquid? A. Yes.

(Testimony of Walter E. Packard.)

Q. It was hydrochloric acid? A. Yes, sir.

Q. Then you got some dust somewhere in the orchard, did you? A. Yes.

Q. When and where did you get the dust in the orchard?

A. I think on each of the trips I made in July in 1943, and also in 1944, I carried acid with me and tested dust not only on the Pista ranch but on the other properties. [543]

Q. We are far away from my question.

A. I'm sorry.

Q. When you collected this dust in the orchard, where in the orchard did you collect it? I want to know what dust you picked up or how or where in the orchard?

A. I didn't pick it up. I would simply drop a drop of acid on a leaf that contained dust to determine whether it was dust from the plant or not. I didn't collect dust; I simply tested it where it was, and I did that all over the orchard—Mr. Pista's orchard.

Q. On leaves?

A. On leaves and on fruit and on weeds and other growth—anywhere where I wanted to determine whether the dust was from the plant or not.

Q. You would put how much of this hydrochloric acid on a leaf? A. A drop.

Q. With a medicine dropper or an eye-dropper, or something like that? A. Yes.

Q. As large a drop as would come out of an eye-dropper? A. Yes.

(Testimony of Walter E. Packard.)

Q. Then when that dropped on the leaf, you were depending on visual observation to give you the results, were you? A. Yes.

Q. What visually did you observe in the way of a chemical reaction upon the dropping of that acid on the leaf?

A. As soon as the acid reached the dust, if it was dust from the plant it immediately boiled up; there was an immediate reaction, a boiling effect, bubbles, as it were. It was very [544] easy to distinguish. If there was not carbonate present you didn't have that particular reaction, if it was just an ordinary earth, unless the earth contained lime.

Q. What reaction, if any, would you get if there were a calcium oxide present?

A. I am not positive; I think you would get—I can't say.

Q. You don't know, do you?

A. No, sir, I don't. I don't know.

Q. Then from any test you made of dust—

A. I should know, but I don't know that question.

Q. From any test you made in the field can you say or not whether there was any calcium oxide on any leaf in the Pista orchard from any test you personally made?

A. Yes; from my understanding of chemistry that acid shows carbonate but doesn't show oxide.

Q. Getting back to my question: From any personal chemical test that you ever made at any time in the Pista orchard you cannot say whether or not

(Testimony of Walter E. Packard.)

calcium oxide was present, can you, one way or the other? A. No.

Q. And you can't say one way or the other whether any calcium hydroxide was present on the vegetation, can you? A. No.

Q. And you can't say one way or the other whether any magnesium oxide was present on the vegetation? A. No.

Q. And you can't say one way or the other whether any magnesium hydroxide was present on the vegetation, can you? A. No. [545]

Q. This test you made was a purely qualitative test, was it? It wasn't quantitative?

A. Yes, that is correct.

Q. That is correct?

A. That is correct. I did make this other observation, though, that dealt with the question that you have just asked: I did test leaves of apricot trees with oxide and hydroxide of calcium, and it did leave a burned area on the tender leaves. I observed the orchard to find out whether or not there were any indications of either an oxide or a hydroxide, that is, a burned area on the leaves, and I was unable to find any indication whatever of the effect of caustic lime.

Q. I will ask you this, Mr. Packard: The amount of damage that might be done by dust in apricot blossoms, assuming the dust damaged it at all, would be greater, would it not, the longer the blossom time extended? A. No, not necessarily.

Q. I will ask you this—

(Testimony of Walter E. Packard.)

Q. My answer would be No directly to that.

Q. Have you finished all you wish to say in answer now? A. Yes, sir.

Q. I will ask you whether or not the greater the length of apricot blossom time the greater will be the opportunity for dust damage in the blossom.

A. No, sir, I would say not, and for this reason: The pollinization, which is the important process in this whole activity, occurs usually either prior to the time the blossoms open up or within a few hours after they [546] open up. Now, the stigma may remain receptive if it is not pollinated for a period of from two to ten days, but ordinarily the pollination takes place either prior to opening or immediately thereafter. Now, it doesn't make any difference, after the pollination has taken place, how long a time elapses; there is only one time element involved for each flower. Each flower doesn't remain during the entire blossoming period, and the reaction is on an individual flower, not on all flowers; consequently the extension of time makes no difference; it is only one time for each flower.

Q. Do or do not apricot trees in blossom time ever go through more than one cycle of blossoming?

A. I have never heard it called a cycle before, but it does go through various stages of blossoming where you have an early opening of some blooms, then another opening of blooms, and then another extending over a period of perhaps three weeks, and it could be very easily described as a series or cycles.

(Testimony of Walter E. Packard.)

Q. Do you mean by that that some of the buds are pink and open up earlier than others?

A. Yes.

Q. And it is the various stages of development, then, that will control the length and cycles of blossoming, is that correct?

A. The rate of development of different buds, some opening early, some later, and some still later, on the same tree.

Q. Now, these rainfall records you gave—Have I got them [547] here, I wonder? You had some figures there for February and for March 1943.

Mr. Moore: I think they are there.

Mr. Naus: I would like to turn to them.

Q. Is this what you were using yesterday, Mr. Packard, in giving those figures and testimony?

A. Yes.

Q. That is Defendant's Exhibit R. Now, you mentioned quite a number of days in the last half of February and the first half of March that you spoke of as days of rain. Isn't it the fact that on a number of those days that you referred to the rainfall in the aggregate was only .01 or .02 or .03 of an inch?

A. The rainfall during that period varied from .01 to .4 of an inch.

Q. Let me see if I can find it—

A. No, to .86 of an inch; nearly an inch.

Q. All right. That was on what date?

A. That was on the 9th of March.

Q. Now, then, you based your opinion of dam-

(Testimony of Walter E. Packard.)

age from rain particularly on that rainfall on that day, didn't you? A. No, sir.

Q. What rainfall did you base it on?

A. I based it on the rainfall from February 21 to March 15, or to March 11, really.

Q. Take that day where the rainfall was .86 of an inch. You understand, do you not, that is the total or aggregate over a 24-hour period?

A. Yes.

Q. Would it make any difference if that .86 of an inch fell [548] during the entire period of 24 hours as distinguished from being concentrated in a very short period of time during that period?

A. Oh, it might make a difference.

Q. Which do you understand is the way the rain fell?

A. I understand it didn't come all at once—well, excuse me; I have no data whatever upon which to make an estimate of that. I don't know.

Q. The point is, you don't know anything about that, do you?

A. I don't know how the .86 of an inch of rain fell on March 9 in the Natividad area.

Q. Now, you spoke something about the Bordeaux mixture. If a Bordeaux mixture is put or sprayed onto an apricot tree when it is in the later pink bud stage but not yet in the white blossom stage, it won't interfere with pollination or fertilization, will it?

A. If it is strong, it will burn the blossom, if it

(Testimony of Walter E. Packard.)

is too strong; the ordinary Bordeaux spray will not injure the blossoms.

Q. When you get into degrees of strength, what do you call an ordinary Bordeaux spray? What is the formula used?

A. Well, ordinarily 8-8-50 is the usual dosage; sometimes 5-5-50, meaning 5 pounds of lime, 5 pounds of copper sulphate, to 50 gallons of water. But there are two elements in that that are effective, and if you put on too much of the copper sulphate you will burn the leaves from the effect of that insecticide. [549]

Q. Well, now, take a Bordeaux mixture of 8-8-50, will that burn the leaves?

A. No, that is a perfectly safe formula.

Q. Take a Bordeaux mixture of 5-5-50, will that burn the leaves?

A. No, that is a perfectly safe formula.

Q. Taking a Bordeaux mixture of 8-8-50 sprayed on the buds in the pink stage, will that injure them or interfere with pollinization or fertilization?

A. No.

Q. And the same question with respect to a Bordeaux mixture of 5-5-50? A. No.

Q. Take a Bordeaux mixture sprayed on the white apricot blossom, 8-8-50, will that interfere with pollination or fertilization?

A. No. May I qualify that statement? Ordinarily not. Under field conditions, I would say No. Under laboratory conditions, where you simply throw it on with an atomizer so that all of the

(Testimony of Walter E. Packard.)

stigma is covered prior to the time of pollinization —under those specific conditions, then there would be an interference with pollinization.

Q. Caused by what?

A. Caused either by a mechanical stoppage of the area or by creation of an alkaline reaction in the juice that is exuded by the papillae that form the surface of the stigma.

Q. You mean that sticky stuff that the stigma secretes? A. Yes.

Q. Or exudes, is that it? A. Yes, sir.

Q. Does the damage come about through the chemical neutralization of it?

A. Ordinarily, yes, it is more apt to do that [550] than mechanical injury.

Q. Well, would anything that chemically neutralized the acid of that stigmatic secretion interfere with pollination or fertilization?

A. If it covered all of the stigma so that the entire surface upon which pollen grains may rest is neutralized. If, however, only a portion of the area is covered or neutralized by the addition of some material, then pollen may still germinate on the areas that are not affected by it.

Q. Well, would you say that a small quantity sprayed on the flower in the year 1944 might be perfectly safe, but a larger quantity sprayed on a flower in the year 1943 would be dangerous?

A. No, I think not, because the experiments that have been conducted that I have seen, and in my conversations with specialists at the University, I

(Testimony of Walter E. Packard.)

assume that there is no danger of—no serious danger of lack of pollination if you sprayed during full bloom.

Q. I am speaking now of getting to the point where a sufficient quantity would be put on; even in full bloom you can get to the point where by adding to the quantity of alkaline material you can reach a point of danger, can't you?

A. Yes, under that assumption, yes. I don't accept the assumption under field conditions, but under that assumption, yes.

Q. If anything were deposited out of the air that was in the nature of fine dust of an alkaline nature, couldn't that come down in sufficient quantity to interfere with the pollination [551] in blossom time?

A. It could, but in my estimation it doesn't in the Natividad area, and for this reason: The dust is carried a considerable distance. I have estimated it to be carried in some cases a number of miles, and therefore the area immediately around the plant gets only a certain proportion of dust, the largest percentage in terms of total weight; but the dust particles that have fallen on the Pista property fall in a scattered pattern so that over a period of one day or a week you see on new vegetation just a scattered pattern of the particles that you can see. Now, it would take, in the largest size particle that Dr. Duschak testified to, it would take about twenty of the largest put end to end to go across the stigma of a normal apricot blossom, or it would take per-

(Testimony of Walter E. Packard.)

haps something over 3,000 of them to cover the area of a stigma. Now, in my observation of the pattern of dust on new vegetation and new leaves in the Pista orchard, I found no indication whatever that there would be any chance—any possible chance of enough dust landing on the stigmas of the flowers of that orchard to create an alkaline reaction on the stigma that would prevent pollination, because each flower will give off perhaps in excess of 100,000 pollen grains. A very large number of those pollen grains can rest on a stigma. Any one of them germinating will eventually bring about the fertilization of the ovary. So, I think that the chances under those conditions are so utterly remote that I am perfectly [552] frank in saying that I think no dropping of dust on the Pista orchard could possibly have affected pollination.

Q. Well, now, let's see. You say it would take twenty particles of that Natividad dust, twenty particles, you say? A. Of the largest size.

Q. Of the largest size?

A. It would take a thousand of the smallest.

Q. We have got billions of them to go with. You say that it would take—that twenty of those largest particles of the Natividad dust would completely cover one line across the stigma?

A. Approximately, yes, of 100 micron dimension.

Q. That it 325 mesh; that is the larger dust?

A. No, that is much larger than that. The 325 mesh is, I think, 54 microns.

(Testimony of Walter E. Packard.)

Q. How many of the 325 mesh would it take to make a line across the stigma?

A. I was thinking of that size when I gave the 20 figure.

Q. I thought you said so.

A. Yes, that was correct. I was thinking of the 24—or the 54 micron size.

Q. It would take about 20 of the larger size, and more of the smaller size, to make one continuous line across the stigma, is that correct?

A. No, it would take as high as a thousand of the smaller particles end to end to cross the stigma.

Q. The stigma has a circular area, doesn't it?

A. Yes. [553]

Q. And the stigma would be completely covered in the area of the circle having a diameter of 20—a line of 20 of these larger particles, wouldn't it?

A. Yes.

Q. Perhaps somewhere around 250 or 300 of these larger particles of dust would completely cover the stigma of one blossom, wouldn't they?

A. It would be about 320.

Q. Approximately 320 of the larger particles of this dust would completely—completely and solidly cover the circular area of the stigma in one apricot blossom, wouldn't they? A. Yes.

Q. By the way, referring—

A. Of that size, of the size 54—

Q. That is what my question asked.

A. Yes, I wanted to be specific on it.

Q. Now, turning to Defendant's Exhibit T, how

(Testimony of Walter E. Packard.)

many times is that apricot blossom magnified from natural size? A. I think it is five times.

Q. You mean—

A. No; wait a minute. I did that with a pantograph, and I took the exhibit in the bulletin which is much larger. I can't answer the question; I don't know.

Q. All right. Did you with the pantograph transfer the illustration in the bulletin to this paper by increasing that five times? A. Yes.

Q. By increasing the text illustration five times?

A. Yes.

Q. But the text illustration to begin with is an enlarged [554] illustration, isn't it?

A. Yes, that is right.

Q. I will ask you again, can you or not tell me how many times this Exhibit T showing an apricot blossom is magnified over natural size?

A. I can't say, but very many times.

Q. This shows a fertilized ovule there, does it not? A. Yes.

Q. It is a diagrammatic representation?

A. Yes, it is a diagrammatic representation.

Q. It diagrammatically represents the longitudinal section of an apricot blossom after pollinization and fertilization has completed?

A. Yes.

Q. The long stem from the stigma at the top to the ovary sac at the bottom is called the style, isn't it?

A. The style is the stem of the pistil. The

(Testimony of Walter E. Packard.)

filament inside as shown there is not the style. That is designated—I can't see now the name; it should be there.

Q. You drew it.

A. Yes, but I say this is the filament—ordinarily called the filament of the growing pollen.

Q. You copied all these lines and copied all of these words from a book, didn't you? A. Yes.

Q. Now, getting back to my question: The long stem from the stigma at the end of the pistil to the ovary sac at the bottom of the long stem is called the style—s-t-y-l-e—isn't it?

A. The outer stem, yes. The inner side is the filament; the outside is the style.

Q. I am asking you the whole stem; that is the name of the [555] aggregate of the stem?

A. Yes, that is right.

Q. The pollen travels down the channel inside of the style, doesn't it?

A. No, there is no channel. The cells inside of the style are in contact; there is no airway between them, but they are so constructed that when a pollen filament begins to grow through, just like a root does in soil, it forces its way through and the cells separate. There is no open channel containing air that the filament goes into.

(Thereupon a recess was taken until 2:00 p.m. this date.) [556]

Thursday, September 21, 1944,  
2:00 p.m.

WALTER E. PACKARD

resumed.

Cross-Examination—(Continued)

Mr. Naus: Shall I proceed, your Honor?

Q. Mr. Packard, you were speaking of the quantity of dust this morning that it would take to completely cover the one stigma; do you recall?

A. Yes.

Q. I think you finally concluded that, assuming a 325 mesh size of particle, it would take 320 particles of that size to completely cover the stigma?

A. Yes. That was a very rough estimate, but that was the figure.

Q. What size particle is 325 mesh?

A. 50 microns.

Q. A micron is one-millionth of an inch, isn't it?

A. I do not know. It is a thousandth of a millimeter. I can't transfer it into inches just offhand.

Q. When you have used the term "micron" at any earlier point in your testimony, have you used it without knowing what the size was?

A. No, I think of it in terms of microns, not in terms of inches.

Q. The letter here from Dr. Duschak speaks of the smallest particle as being 5 microns in diameter. I will ask you generally, in order to get some idea of the size we are talking about, if you take the smallest particle that has been mentioned in this case, 5 microns, in Dr. Duschak's letter,

(Testimony of Walter E. Packard.)

[557] whether a cubic inch of material—any material, dolomite or anything else—we will assume dolomite—if one cubic inch of it was reduced to cubes 5 microns long each edge, whether if they were laid out solidly on the ground, one cubic inch reduced in size that much, it would cover three acres of ground.

Q. Do you want me to try to figure that out?

Q. You do not know?

A. No, I do not know.

Q. If we once find out the size of the micron we can figure it for ourselves, I take it?

A. I told you a micron is a thousandth of a millimeter.

Q. All right. We will pass from that. Now, in your observations that you made down around the stacks, the Pista, the Anderson and the other orchards in the neighborhood, state whether or not you have observed the direction of the prevailing wind down there? A. Yes.

Q. What is that direction?

A. From the west towards the east, and from the northwest towards the southeast.

Q. On the average does the wind blow or not at some time during the 24 hours from the stack over toward the Pista orchard?

A. During some days, yes; during some days, no.

Q. What would you say the average number of hours, if hours, out of the 24, the wind would be blowing from the stacks toward the Pista orchard?

(Testimony of Walter E. Packard.)

A. I find it rather difficult to make any exact determination of that. I went into the wind direction studies rather carefully. I got the records from the Army, [558] which takes the wind direction five times each day, and I found I could hardly draw proper conclusions from that, because I was not certain that the direction of the wind at the airport was exactly the same as the direction at the mill. However, I did observe the direction of the dust at the mill, and on most of the days that I was there the dust was blowing almost directly toward the hills which are immediately east of the mill. Then, because I felt that the records that were available at the Army air base and the records of the Weather Bureau could not be interpreted completely in this area because of local conditions, I tried to ascertain the effect of the wind by going through the territory and observing the amount of dust that fell, and my observations there—I climbed the hills back of the mill, went into the valleys back of those hills, and I went around in other directions, and my observations indicated that a very large percentage of the dust was deposited on the hills east of the mill, which checks with the prevailing wind as given by the U. S. Weather Bureau, which shows for that area prevailing wind from the west to the east, and from the northwest to the southwest.

However, I did also observe the phenomena that Mr. Anderson spoke about in his testimony, where, when the dust goes immediately up during a calm

(Testimony of Walter E. Packard.)

period, that it does umbrella out, and there is, when that occurs, I think, a general—or my observations during the time I was there—there was a [559] general drift of that high dust cloud toward the Pista ranch and up toward that canyon, which is another reason for believing that the dust that—I observed more dust toward the house at that end of the orchard than the other. I think that was the reason for there being a little more dust at that portion of the ranch than elsewhere. Those are my observations on the wind.

Q. When that dust umbrellas out in the way you mentioned, does that umbrella completely cover the whole of the Pista orchard?

A. Oh, I think not, no.

Q. How much of it does it cover?

A. That depends. You will find, or at least I found, that the records taken by the Army show various directions for wind that is below three miles an hour; that is frequently considered as calm period. Sometimes the wind would be blowing towards the Pista orchard, that is, this drift would be towards the Pista orchard, and other times it would not be. I, however, was unable to determine from the records just what proportion of the time it would blow in the direction of the Pista orchard, but in my observation I think more than a proportionate time of the calm period it would flow toward, and would be quite up, several times as high as the stack.

Q. I understood you a while ago to speak of the umbrella-like appearance as occurring, at times

(Testimony of Walter E. Packard.)

when there was no wind, during a calm period, is that right?

A. Yes, I tried to define [560] the calm period as a period when the wind was blowing at a very low velocity, because the Army does record it that way. When it is blowing I think below one mile an hour it is considered calm, and in other records below three miles it is considered calm.

Q. I understood you to say independently of the Army records that you could see that umbrella in the air? A. Yes, yes, you can.

Q. So my question does not relate to the Army records; it relates only to the visual observation that you made, and as I understand it now, you visually observed an umbrella-like effect during the periods of calm; have I got it right? A. Yes.

Q. Now, when you could visually observe the umbrella during periods of calm, I am trying to find out whether that umbrella thus observed descended over the Pista orchard.

A. I am trying to remember just what—as I recall the phenomenon, this umbrella-like cloud of dust would hang rather close to the hills and move along the hills around the curve, the end of the hills, so that it would be over a portion of the Pista orchard. It was when I observed it. But it wasn't, I would say, over all the orchards, because it extends a rather long distance east and west.

Q. Let me see if I understand that long answer. Would I fairly state it in its simplest possible form if I stated that you answered Yes, that during periods of calm you observed with [561] your eye

(Testimony of Walter E. Packard.)

that umbrella-like appearance in the air extending over the Pista orchard in whole or in part?

A. In part, yes.

Q. Now, how much of it?

A. I did not try to determine that, sir. I can make really—there is no use of my trying to make a guess, but it would go over the southeastern corner of the ranch at approximately where the house is, which is a comparatively small portion of the whole property.

Q. Speaking of the orchard, and assuming it to contain an aggregate of 44 acres of apricots, how much of those 44 acres did that umbrella extend over that you saw with your eyes?

A. I can't say exactly. I can't even give you an exact estimate, but I can give you what might be called a very, very rough estimate.

Q. I hope you will, and get to it, please.

A. It would be, I should say, over perhaps eight or ten acres, perhaps. I should say about eight acres.

Q. Now, Mr. Packard, from all your investigation, observations and studies that you made at any time down there, how many tons a day of this stack dust would have to be lost by the stack into the atmosphere per 24 hours to completely cover the stigma in the orchard with particles of five microns in diameter?

A. Why, that is impossible for me to state. I can, however, say that there would be very little chance that there would be anything like enough

(Testimony of Walter E. Packard.)

dust to do that, because the facts, when you compare them to the velocity of the dust [562] leaving the stack, would indicate that the dust is carried over quite a large area, and that the very small particles may be carried 40 or 50 miles from the mill. It is impossible to determine just the area that was affected by those particles, and I could not make such an estimate.

Q. Do you mean to suggest that particles of dust from that stack wander in the atmosphere up to 40 or 50 miles from the stack?

A. Oh, I think so, just like the dust from a volcano may extend around the world and remain in the air for years at a time and obscure the sun.

Q. Are you prepared as a scientist to liken these belching stacks to a volcano, Mr. Packard?

A. No, sir, but I can by applying Stokes' formula indicating that the dust would be carried many, many miles.

Q. I am speaking not of volcano dust—

A. No, I am speaking of cement dust.

Q. But of the stack dust?

A. I am speaking of this particular stack dust. By applying that formula you can see that it would be carried many miles, the small particles of it.

Q. As part of your inquiry and investigation down there did you attempt to determine how far from the stack you could find evidence of the dust?

A. Yes—

Q. All right.

A. No, no, I did not. I found evidence of the

(Testimony of Walter E. Packard.)

dust more than three miles from the mill, but I did not try to find evidence of the dust beyond that, but I am very [563] certain that quite a large proportion of the very small particles were far beyond that.

Q. Getting away from theory or assumption, tell me, please, the greatest distance from the stock you ever observed this dust.

A. About three miles.

Q. By the way, when this umbrella of dust is in the atmosphere such as you observed, wouldn't any rain, even a light rain—wouldn't the particles of rain have a tendency to carry that dust right down to the ground practically perpendicular or the direction that the rain was falling?

A. No, sir.

Q. Why not?

A. I can't explain why. All I know is in observation it does not, any more than smoke from a stack comes down when it rains. The smoke continues through the rain without coming down. So does the dust here. I do not know why the particles coming in contact with it do not carry it, but apparently they do not. The dust continues on through the rain and the fog.

Q. From the stack there come both gas and dust particles, don't there? A. Yes.

Q. And that is all that comes from the stack, gas and dust particles? A. Yes.

Q. Now, the gas that comes from the stack will necessarily, whether it is raining or not, expand indefinitely, won't it? A. Expand?

(Testimony of Walter E. Packard.)

Q. Yes, all gases expand. A. Do they?

Q. I thought so. I ask you as a scientist.

A. Under certain conditions. Under certain other conditions they contract. It depends on the conditions.

Q. When they are released into the atmosphere don't they expand?

A. Under certain conditions, yes.

Q. Do they expand when it rains?

A. Ordinarily a hot gas might contract rather than expand, unless it is extremely hot when it leaves the mill. You would have to determine the conditions, but the gas coming out of a stack would, of course, disperse, if you want to use that word instead of "expand." I think from the standpoint of physics it might contract rather than expand. It would disperse, however.

Q. I will ask you now: Can you give any estimate whatever of how many tons a day of dust had to go out of the top of the stack as stack loss to completely cover a stigma with dust one particle deep?

A. No, but I can tell you this: that I observed the Pista orchard in July 1943 after dust had fallen on it for some months, and judging from the thickness of the coating of dust then, which did not cover either the ground or the leaves completely at any time, I would say that in the short number of hours that the stigma is receptive, that is, pollination takes place, there would be very little chance indeed of ever having enough dust on any single stigma to affect pollination.

(Testimony of Walter E. Packard.)

Q. How many tons a day stack loss would there have to be to [565] have that result?

A. I never tried to figure it. I just did not see it on the ranch. It wasn't there, and I don't know—I couldn't figure it theoretically.

Q. Are you prepared to say one way or the other whether 56 tons a day were being lost out of the top of the stack—56 tons of dust—whether that would have the effect of covering the stigma, or about that?

A. I would say not, because my observation has been that much more than that was coming from the Cowell stacks; it did not do it there, and I would judge it would not do it here.

Q. How many tons were involved in this other place you speak about?

A. I think as high as 90 tons a day came out of the stacks.

Q. By the way, in your criticism of the Anderson report that is in evidence here, the Cornell report, I understood you to say that you concluded that Anderson's results could be explained only if certain things occurred during a driving rain. Do you recall that?

A. No, I do not recall saying that. I can explain what I did say.

Q. No, wait a minute on that. If you are trying to tell me now whether the reporter did not get you correctly in writing down what you said, that is one thing. If you wish to explain what you said, you may do so.

(Testimony of Walter E. Packard.)

A. May I have the reporter read that?

Mr. Moore: The witness has a right to have the testimony [566] called to his attention, Mr. Naus, that you are interrogating him with regard to. It has been written up.

The Witness: May I have my answer read?

Mr. Naus: Well, I would have to go through the transcript to find it. I know definitely that I wrote that phrase "driving rain" down in quotes while you were testifying, and it was in the course of your criticism of the Anderson report, but rather than taking up the time of the Court going through, I will pass it, because I know when I read it and his Honor reads it he will find it.

The Witness: I know what I said, too.

Mr. Naus: Q. What did you say about driving rain, according to your recollection?

Mr. Moore: I object to a debate between counsel and the witness. We have a daily transcript written up, and the witness is entitled under those circumstances to have his attention called to what he did say.

The Court: Call it to his attention.

Mr. Naus: I will pass it, then. I will call it to your Honor's attention in the briefs. I do that because I do not want to take the time now to study through it. I have not run through the transcript for that purpose.

Q. Mr. Packard, what is the diameter of the foliage of these trees, the apricot trees, in the Pista orchard on the average?

(Testimony of Walter E. Packard.)

A. I do not know. [567]

Q. What is your best estimate?

A. I have never tried to estimate it. I haven't the slightest idea.

Q. What is the distance between the centers of trees, roughly?

A. I think 24 feet on the Pista orchard.

Q. As that foliage extends out in the air above the ground, how much clear space is there between the rows of trees?

A. I never tried to estimate it. It would be the roughest kind of a guess.

Q. What is your best estimate?

A. My best estimate would be perhaps a sixth or seventh or eighth, perhaps, of the area that would be free from having the trees immediately above it.

Q. I am asking you what is the clear space between trees in feet?

A. 24 feet space between the trunks of the trees.

Q. I am speaking between the foliage of the trees above the ground.

A. Sometimes the foliage may contact in the middle and other times, when the trees are young, there will be quite a wide space—20 feet when the trees are young.

Q. Evrybody knows that. I am trying to speak of the condition in 1943. We all know what we are talking about. How much clear space was there between the trees?

A. It varied on the Pista orchard very appreciably.

(Testimony of Walter E. Packard.)

Q. What is your estimate of the distance?

A. I would say it varied.

Q. Between what and what?

A. On the stunted trees on the hillside I should say half of the area between the trees was [568] not covered by the leaves. Some of the best trees, I should say that perhaps not more than three or four feet, perhaps, would separate the leaves from, oh, maybe five feet—three or four feet between the leaves of the next branches.

Q. Do you mean, then, anywhere from a minimum of 3 or 4 or 5 feet up to a maximum of 12 feet? Is that your answer finally?

A. Yes, that would be about it, but that is, of course, a very rough estimate. I never tried to get an exact answer.

Q. You spoke of the number of buds you counted on the ground at one time under a typical or average tree.

Mr. Moore: I object to that. It wasn't buds; it was small apricots, Mr. Naus, assuming facts not in evidence.

Mr. Naus: Mr. Moore, I would be delighted if occasionally when you object you would let me finish a question.

Mr. Moore: Very well; go ahead, then, and then I will object.

Mr. Naus: Q. Mr. Packard, did you at some time count something on the ground under those trees? A. Yes.

Q. What was it?

(Testimony of Walter E. Packard.)

A. They were young cots.

Q. Were they counted on the ground under some typical or average tree?

A. I tried to get an average, yes, sir.

Q. Is your answer "Yes"? A. Yes.

Q. Yes. I understood you to say you counted them under what you call one-eighth of a pie section. A. Yes.

Q. A triangular section with the curved end of the pie? A. Yes. [569]

Q. You found 802? A. Yes.

Q. So you necessarily calculated that there would be roughly 6,416 under the typical or average tree that were thinned off?

A. I said under that particular tree, yes.

Q. I know, but that particular tree, was it or wasn't it selected by you as a typical or average tree?

A. It was selected as an average tree of those trees that were thinned, and as I said in my testimony yesterday, some trees were not thinned.

Q. Of the total 44 acres what proportion was thinned and what proportion was not?

A. I can't say, but there were some trees that were not producing well enough to require thinning, and consequently they were not thinned. And I made no attempt to make an estimate. Most of the trees, however, were thinned.

Q. When you say "most," approximately what percentage of the orchard?

A. I would say three-quarters of it.

(Testimony of Walter E. Packard.)

Q. Then this tree that you counted these cots under was a typical or average tree with respect to three-quarters of the orchard; do I now get it right? A. Yes.

Q. So that there would be 6,416 cots by calculation under the typical or average tree relating to three-quarters of the orchard? A. Yes.

Q. I understood you to say that if they had grown to cots of the size 12 to a pound that would be at the rate of 20 tons to the acre?

A. That is as I figured it, yes. [570]

Q. I will put it this way: Those cots that were taken off were what proportion of the total cots that were originally on the tree?

A. I have no idea.

Q. Could you estimate it now?

A. No. You see, an apricot tree will produce 20 times as many blossoms as could ever mature, and they always drop a very large proportion of the blossoms during one stage or another between the period of the first blossoming to the final ripening of the fruit, and so single trees may carry as high as 60,000 blossoms, and that gets into very, very large figures in tons per acre. So that I could not answer your question directly.

Q. Mr. Packard, we will get at that this way, then: When you estimate something or other on the basis of 20 tons to the acre on the ground, you know, do you not, that that is on the assumption that those cots that were thinned off the tree, if

(Testimony of Walter E. Packard.)

they had grown to a size 12 to the pound, would produce 20 tons?

A. Yes—no, no—under your assumptions, yes. They never would have grown to that size. They would have been very small.

Q. That is what I am coming to. As a matter of fact, the tree after thinning will grow in the aggregate to the same tonnage of fruit as if it had not been thinned by reason of the remaining cots growing larger?

A. The tonnage might have been a little smaller, but a great deal of the difference would be made up by having larger cots, but I can't tell you [571] exactly what the difference would be. There would still be a difference.

Q. At any event, thinning off at the rate you suggest certainly does not decrease the tonnage of a tree by 20 tons?

A. Oh, no.

Q. As a matter of fact, after thinning to the extent it was thinned, did it make any substantial reduction in the product of the tree in tonnage of fruit?

A. Well, as I said before, I think it probably did make some difference in total tonnage, but the tonnage of fruit that he did get would be fruit of very much higher quality, but I rather think that the total tonnage, if he had allowed them on and they had been allowed to remain until they matured, even into small cots, would probably have been somewhat greater in tonnage, but it would be mostly seeds and small cots.

(Testimony of Walter E. Packard.)

Q. Speaking of apricots, without regard to the Pista orchard, and without regard to the year 1943, but all apricot trees in California in all years, is it or not the fact that apricots tend under favorable conditions to set heavily? A. Yes.

Q. Is it or not the fact year by year and in apricot orchards generally, that thinning is a very common practice from year to year?

A. Oh yes, yes, sir.

Q. Is it or not the fact that, speaking generally, apricot trees have to be thinned in order to produce nice fruit of a proper size? A. Yes.

Q. Is it or not the fact, with respect to the thinning that you [572] observed in the Pista orchard, as to the year 1944, that the thinning you saw was no more than was necessary and was entirely proper?

A. Yes, entirely proper, good practice.

Q. Now, you spoke of three things that in your theory or opinion caused the small crop in 1943. First was weather.

Mr. Moore: What date was that, Mr. Naus?

Mr. Naus: This is 475 and 476.

Q. In speaking of that, under your first ground, you spoke of the winter being unusually warm. Do you remember that? A. Yes.

Q. When you say unusually warm, you mean what temperature at what time?

A. I do not mean any temperature at any time, but compared with other years it was a warm year. The theory is—the scientists at the university and

(Testimony of Walter E. Packard.)

in the Department of Agriculture—that an apricot tree must have, as I recall it, about 900 hours of temperature below 40 during the dormant period in order to bring it through in a proper way, and when it drops below that total figure there is apt to be a weakening of the tree, and in 1942 and 1943, the winters of those two years, the winter was warm in relation to the requirements of apricot trees in Monterey County.

Q. 900 hours in the period from what date to what date, or from what stage of the tree to what stage of the tree?

A. During the dormant period of the winter from, I should say, the 1st of November to the last of January or into February, but [573] generally I think the last of January.

Q. Have you calculated the number of hours that the Pista orchard had below 40 in the winter in question?

A. I made an attempt to do it and I found that the number of hours was between five and six hundred, but I am not at all sure that I did that work accurately, because I had never attempted to do it before, and the figures came out so low that I rather think I must have been in error, but I took the records at the Army Air Base, where the temperatures, maximum and minimum, are recorded five times a day, and I added them all up, but I rather think that I did not do it in a proper way, and consequently I did not put much confidence in my own

(Testimony of Walter E. Packard.)

figures, but I did get about five or six hundred hours.

Q. You spoke of the Army Air Base; do you mean at Salinas? A. Yes.

Q. Are you prepared, as you sit there, under oath, to say definitely one way or the other whether the Pista orchard did or did not have 900 hours below 40 degrees in the dormant period from the end of 1942 to the end of the period in 1943?

A. No, sir, I am not, but I assume from my observations and studies and conversation with experts in that line, that it did not.

Q. Assuming, then, on your theory, whether it be true or not as to fact, but assuming it did have less than 900 hours below 40, I understood your answer from the transcript to be that that causes a falling of the buds, is that correct? A. Yes.

Q. Leaf buds and fruit buds? A. Yes.

Q. Does that mean cots? A. No.

Q. The warm winter, to characterize it in the way spoke of then, would result only in reducing the number of buds remaining that could blossom, is that correct? A. No, sir.

Q. What does it result in?

A. It would do that, and in addition it would extend the blossoming period out over a longer period, so that it would have those two effects. [574a]

Q. Let me see if I have the two effects right. If there were a warm winter in the sense that you have used the term, one effect would be to reduce the number of buds that would go into blossom,

(Testimony of Walter E. Packard.)

and, No. 2, extend the blossoming period of those that did blossom, is that correct? A. Yes.

Q. Then, in turn, the possibility of fruit setting would depend solely on what blossoms did come out on the tree in the spring of 1943, wouldn't it?

A. No, sir.

Q. What would it depend on?

A. Because the rainfall, the temperature and the foggy condition during that period created other conditions that also affected the number of blossoms that could finally develop into mature cots.

Q. I think perhaps you misunderstood me. You gave three reasons for the small crop. I am taking them up one at a time. I think you are now stepping into your second reason, aren't you?

A. I thought I had to in relation to the question you are now asking me.

Q. I just want to take the three things one at a time. I want to take, No. 1, the warm weather, and see what effect that would have.

A. The warm weather, as I stated in my previous testimony now, not referring to the warm weather, but to the warm period during the time of blossoming and just prior to blossoming, where you also had a very damp and rainy condition, where you had a warm, humid condition, you had a perfect climatic condition for the development of jacket rot, brown rot, [575] and other rots of that kind that did cause a very large drop of apricots in the State of California.

Q. Stepping that to the second matter of rain and rot, it already appears from the case, as I

(Testimony of Walter E. Packard.)

understand it, that you did not actually observe that in the blossom time of 1943?

A. No, sir.

Q. So you are reaching that theory or conclusion of rot in the way you speak about purely from theorizing? A. No, sir.

Q. What do you base it on?

A. I base it on my conversation with Mr. Lewis, with Mr. Tavernante, the County Agent, Mr. Saunders, the agricultural agent in Hollister, with the County Commissioner in San Benito County, with Mr. Drew, as I recall his name, who is manager of the California Orchard Company, who told me that it was a warm, humid period that was perfect for the development of jacket rot; my talk with professors of the University, the man in charge of the deciduous experiment station in San Jose, and others who, I thought, were informed.

Q. Let me see if I have it right now. Earlier today or this morning you testified never in your life had you seen rainfall on an apricot orchard in blossom time.

A. Did I say that? I do not recall of having done it. I mean I do not recall of ever having seen that.

Q. That is it. No. 2, you did not see the Pista orchard in the spring of 1943, so it comes down, then, does it not, to your basing your judgment only with respect to rot on a lot of [576] conversations you have had with a great many people?

A. No, sir.

(Testimony of Walter E. Packard.)

Q. What does it depend upon besides that?

A. It depends on the records of the weather, on rain, on temperature, on the number of clear and cloudy days, and upon my conversation with scientists who were studying that particular problem for that particular year in that particular county.

Q. The weather bureau records would not tell us a word about rot.

A. I did not say they did. They did tell me about the conditions that existed in Monterey County at that time.

Mr. Naus: If the Court please, in view of the present answers of the witness, I move to strike out his opinion on direct examination that the shortage of the crop on the Pista orchard in 1943 was due in part to the presence of the rot condition that he has spoken of, upon the ground that it now appears that the basis of the witness' testimony in that respect is simply hearsay.

Mr. Moore: We object to that, your Honor. What particular testimony given yesterday or today, Mr. Naus?

Mr. Naus: The testimony given at any time, and starting on pages 475 and 476 of the transcript, where, in the course of giving what he calls three reasons for the short crop on the Pista orchard, he gives as a second reason the development of jacket rot and of brown rot.

Mr. Moore: Will you just point out in here where he says [577] anything about that at this page of—

(Testimony of Walter E. Packard.)

Mr. Naus: If the Court please, I will put it differently.

Mr. Moore: I think you should, because if we are going to strike evidence, we should find what we are striking.

Mr. Naus: I will put it this way, then: The witness has referred to it at different times. I will move to strike out his testimony in the context on pages 475 and 476, where he gives as the second of his three reasons for the shortage of the crop on the Pista orchard in 1943, the development of rot conditions in the form of jacket rot and brown rot; I move to strike it out not only there, but wherever he has stated or repeated anywhere else that statement in the record.

The Court: The Court is prepared to rule; for the purpose of the record the motion is denied.

Mr. Naus: Q. Now, when you speak of jacket rot, Mr. Packard, it is a rot of what vegetation connected with the tree? A. Of the blossom.

Q. The original jacket of the bud, itself?

A. No, it is a disease that affects the young cot as it is developing. It develops in the flower and then goes down into the fruit and then the fruit drops off.

Q. When you used the term "jacket rot" on your direct examination, you meant what jacket? Jacket of what?

A. The apricot when it develops carries the whole calyx with it, and as the cot develops this just pushes out and remains on the top of [578]

(Testimony of Walter E. Packard.)

cot until the wind or something else knocks it off, and consequently it forms a little jacket on top of the young cot, and that includes the remaining part of the blossom, which is simply pushed out as the apricot grows, and this particular fungus disease develops in that jacket and gets down through the cot and then the cot rots and falls off.

Q. My question was, the jacket of what, and as I now understand it, you mean the jacket of the cot, is that correct?

A. It is known as jacket rot. Everybody calls it jacket rot.

Q. But it is the rot of the jacket, isn't it?

A. It is the rot of the apricot and the jacket, both.

Q. What is brown rot, a rot of what?

A. Brown rot is mostly related to green rot, but it is a rot that develops in the tree, itself. The jacket rot develops in the ground and the spores are not carried over and do not develop in the tree. Brown rot is actually carried in the tree, and the brown rot will go down through the cot into the branch and through the twig and will not only kill the cot, but will kill the twig, and I saw evidence of that on the Pista orchard in 1943.

Q. What evidence did you see?

A. I saw cots that were rotted by brown rot, and I saw twigs that were killed by brown rot.

Q. To what extent with respect to the whole orchard? A. Not to any great extent.

Q. I know, but that still is general. To what

(Testimony of Walter E. Packard.)

extent with respect to the whole orchard did you find jacket rot or brown [579] rot present?

A. I didn't say I found jacket rot. I was not there at the time of the year when I could determine that, but I did see the carry-over of the brown rot, and the evidence I saw was very meager. The orchard had been sprayed to control brown rot. Spraying does not control the green rot. It is not recommended as a control except in a sort of accidental way. But the spraying will control brown rot very largely, and the orchard was sprayed and it did very largely control the brown rot that year, apparently, although I did see evidence of it.

Q. Let me see if I can get at it specifically in some way: In the Pista orchard in 1943 there were some 3000 to 3100 apricot trees, weren't there?

A. Yes.

Q. Out of that 3000 or 3100 apricot trees in the Pista orchard, with respect to how many of those trees did you see evidences of brown rot?

A. Very few.

Q. How many would be your top estimate?

A. I don't suppose—I didn't make any estimate, I didn't make any attempt to make a survey of it. All I did was to find out if I found it or not, and I suppose I saw it on perhaps ten trees.

Q. Ten? A. Yes.

Q. As you sit there now, are you prepared to say that in the year 1943 there was visual evidence of brown rot in the Pista orchard affecting more than ten of all the trees?

(Testimony of Walter E. Packard.)

A. No, not of my own observation. [580]

Q. And you have never seen visual evidence of jacket rot in that orchard with respect to the year 1943, have you? A. No.

Q. Now, with respect to the third reason, you could summarize that, generally, could you not, under the heading of rainfall during the period of bloom? A. Yes.

Q. Wasn't there a period of bloom after the last heavy rain during the blooming period generally?

A. Yes, and that, of course, is my reason why—for saying that the third bloom set. The third bloom came after the heavy rains and continuous rains had stopped. At that time the days became clear, and when they became clear you got rid of that mucky, warm weather, or the temperature at night dropped very much below the temperatures in the previous period, dropped down to 38, 27, in there, in the night time, and in the day time you had bright days, and the heat of the direct sunlight had more to do with the opening and the proper fertilization of apricot trees than does the temperature, itself; so during those clear days when the sun hit the blossoms directly it not only dried the pollen out so that it was available for pollination, but it also enabled the bees to go through the orchard and carry on their process in helping this pollination process.

Q. Mr. Packard, in the year 1943 was there any difference in rainfall as between the Pista and An-

(Testimony of Walter E. Packard.)

derson orchards, on the one side, and the Bardin and the Sterling orchards, on the other?

A. I can't say for sure. I have nothing, no evidence on that. [581] However, I have made this observation that the green rot, if I may go back to that—

Q. I would rather you stayed with the question, unless you think it is responsive to the question.

Mr. Moore: He has a right to explain his answer.

A. It was in relation to the effect of the climate. The Bardin orchard is farmed in better fashion than Mr. Pista's orchard. This year it was plowed a week or ten days prior to the time that Mr. Pista's orchard was plowed. Mr. Pista's orchard was plowed later than any orchard I saw in the area. Now, the green rot will develop in unplowed ground. One of the ways, and the fact is the only practical way that scientists know of, of controlling the green rot, is to plow the land early to destroy the small growth that is in the soil that gives rise to the spores that spread onto the trees, and in 1943 it is possible that the same condition that I observed in 1944 existed then.

I also, in talking over the situation with the county agents, found that the condition over the counties—I mean now in Monterey and San Benito Counties—varies a good deal. It will run a little more in one place than in another, and a very few days in the period of blossoming between different orchards will make a very big difference in the

(Testimony of Walter E. Packard.)

setting of the bloom. In San Benito, for example, they had some orchards yield five and six tons per acre, and their average was the lowest in their history, but other orchards yielded practically nothing at all, [582] and there, their explanation was, they could not say—they could not give all the reasons, but one was they bloomed at different periods, and consequently were affected by the climate in different ways.

Q. Mr. Packard, we seem to have wandered far from the question, so I would like to have that particular question answered. I will re-state it perhaps in different form, because I do not recall exactly how I phrased it. As you sit there under oath, do you or not know of any difference whatever in respect to the rainfall in the year 1943 between the Bardin and Sterling and the Anderson and Pista orchards?

A. No.

Q. There is a defendants' Exhibit X for Identification that Mr. Moore showed you yesterday, and I would like to find out something more about it. Here it uses the phrase, "Basis, naked fruit." Can you tell me what that phrase means?

A. I cannot say for sure. I might surmise, however, that it means net weight, although I do not know exactly what the term "naked" means in this particular connection. I presume it means the net weight of the fruit outside of the box, but I don't know.

Q. Don't you also presume it means the return on the fruit after subtracting the cost of the box in packing? I am simply trying to find out what

(Testimony of Walter E. Packard.)

it means, because if I can find out what it means I might accept the exhibit. Reading it now I don't understand it.

A. As I understand it, the price received, as it says here, by the grower at point of delivery—that means he [583] received so much for the net delivery of apricots at the first point of delivery.

Q. I am trying to find out whether or not you understand that phrase to mean the return for the apricots to the grower after subtracting the cost of the boxes, boxing, grading, and the like.

A. No, not at all.

Q. You do not know one way or the other?

A. No, sir. It is the gross return that he received; it has nothing to do with the cost.

Q. I do not know whether it means that, or not. The final answer is you do not know what the phrase "basis, naked fruit" individually means?

A. I do know it does not mean the net price, that it does mean the gross price.

Mr. Naus: That is all from this witness.

#### Redirect Examination

Mr. Moore: Q. Mr. Packard, you were asked whether you observed any evidence of jacket rot on the Pista ranch when you first visited it in July. Assuming that there had been jacket rot in the blossom time, would there be any evidence of it left in July? A. No.

Q. In other words, in July, even though there had been a great amount of jacket rot, there would have been no evidence there at all at that time, is that correct? A. Yes.

(Testimony of Walter E. Packard.)

Q. By your observation in July and your statement that you observed no jacket rot, you do not know whether there was or was [584] not jacket rot there, except perhaps what you may have heard? A. Yes.

Q. Of your own knowledge you do not know?

A. Yes.

Q. You also said that you did find some evidence of brown rot in July? A. Yes.

Q. And that the orchard had been sprayed?

A. Yes.

Q. Could you see evidence of spraying? How do you know it had been sprayed?

A. I could see evidence of it.

Q. If there had been brown rot there what effect would passage of time to July when you first visited and the effect of spring have on the evidence that would be left, as to whether or not there was brown rot in the pollination period?

A. The spraying for brown rot is not always completely effective, and, in fact, seldom is. Very frequently there are some twigs, some blossoms, and some fruit that is not controlled by the spray, and the evidence that I saw came from the portions of the trees that were not controlled by the spray, although most of the trees were controlled.

Q. I think you misunderstood the purpose of my question. What I am trying to find out is this: You say you estimated from your observation that there was evidence of brown rot on perhaps ten trees?

(Testimony of Walter E. Packard.)

A. I did not look for more. I was just looking for evidence of the brown rot. I did not try to make a survey.

Q. What I am trying to get at is, if there was brown rot in that orchard in February would the evidence remain until July? A. Yes. [585]

Q. That is what I wanted to clear up. Mr. Packard, I hand you a photostatic copy of what purports to be a page out of some document showing 1927 1173 cement and other building materials. I call your attention to the middle of the page, to a paragraph about an inch and a half long, headed "Influence of cement dust on vegetation." Can you tell us from what source you got that?

A. Yes, I got this out of the Chemical Abstract of the Live Science Building and Library at the University of California.

Q. What are the Chemical Abstracts? Whom are they published by, do you know?

A. I think by—I don't know exactly who does publish them, but it is the standard reference for all articles dealing with chemistry. It is a book five or six inches thick for that period, and there is a long series of them. It is the standard reference book for articles dealing with chemical problems.

Mr. Moore: I will ask that this be marked for identification.

(The document was marked Defendants' Exhibit Z for Identification.)

(Testimony of Walter E. Packard.)

Mr. Moore: Q. That is published in America, is it? A. Yes.

Mr. Moore: We will offer at this time, your Honor, Exhibit Z for Identification, together with Exhibit W for Identification, being the "Influence of Cement Dust on Vegetation," by Professor Ewert, who, it has been testified here, was a well-known German scientist on this subject, together with this photostatic [586] copy from the Chemistry Magazine that Mr. Packard has referred to, which on page 1927 refers to this particular work. I am merely giving the name of the author and a summary of it, which shows that it has been recognized as a scientific work in a scientific magazine, and I believe under the rules scientific works are admissible in evidence, and we will therefore offer these two exhibits, together in evidence, after having been identified.

Mr. Naus: If the Court please, I object to the offer of Defendants' Exhibit Z for Identification upon the ground, first, that it is hearsay, second, that it is secondary evidence. I object to the offer of Defendant's Exhibit W for Identification upon the grounds, first, that it is hearsay, and, second, that it appears to be secondary evidence.

Mr. Moore: Our position is, your Honor, all scientific works—they do not have to be published in a magazine or in a book or in book form—are admissible in evidence under the general rules of evidence.

The Court: He is entitled to the best evidence.

(Testimony of Walter E. Packard.)

As long as there is an objection, there is nothing for me to do but sustain it.

Mr. Moore: No further questions.

Mr. Naus: That is all.

Mr. Moore: That is all. That is our case, your Honor.

Defendant rests. [587]

Mr. Naus: I will call Mr. Miller.

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### MAX MILLER

called for the plaintiff in rebuttal; sworn.

The Clerk: Will you state your name.

A. Miller.

The Clerk: Your first name?

A. Max Miller.

#### Direct Examination

Mr. Naus: Q. Mr. Miller, in the year 1943 just before blossom time or at or about blossom time in the Pista apricot orchard did you or not do any work in that orchard?

A. Yes, I did.

Q. And what work?

A. I had charge of the spraying.

Q. Now, did you in addition to your own personal service furnish any equipment during that period? A. I did, yes.

Q. What?

A. I furnished the tractor and—

Q. What size tractor was it?

(Testimony of Max Miller.)

A. 22 Caterpillar.

Q. 22 Caterpillar. What does the "22" mean?

A. Well, horsepower.

Q. You did the spraying. Did you keep any diary or book record at the time of the dates that you worked? A. Yes, I did.

Q. Have you that record here of the dates that you sprayed in the Pista apricot orchard?

A. I have.

Q. In 1943? A. Yes, I have.

Q. You have handed me a book that has numbered pages. A. This is the page here. [588]

Q. Page No. 70?

A. 70, yes. It says right here, "Spray, Salinas." That means the Pista ranch.

The Court: Q. What is your business or occupation?

A. Well, I am doing farming and also commercial work with tractors.

Q. Specializing in spraying?

A. Yes, I have been taking care of Mr. Pista's orchard for several years doing the spraying.

Q. Your work for him is limited to spraying?

A. I work for him also with my tractor.

Mr. Naus: Q. On what dates in 1943 did you spray the Pista orchard?

A. I sprayed February 17—I sprayed the 17th; I sprayed the 18th; I sprayed the 19th; I sprayed the 20th; I did not spray the 21st; I sprayed the 22nd, the 23rd; not the 25th; I sprayed the 24th; not the 26th; the 27th, and 28th.

(Testimony of Max Miller.)

Mr. Moore: Pardon me just a minute. I don't like to interrupt, but with him saying "not" I got mixed up here.

Q. Will you start at the 22nd again, please?

A. I sprayed the 22nd and the 23rd and the 24th, but not the 25th or the 26th. I sprayed the 27th and the 28th, and the first two days of March, the 1st and the 2nd.

Mr. Naus: Q. You did spray?

A. Yes.

Q. Now, did you or not spray the whole of the apricot orchard 44 acres? A. Yes, I did.

Q. Did you or not spray any part of it more than one time? [589]

A. I did, yes.

Q. Roughly what part of the orchard was it that you sprayed more than one time?

A. About in the center of the orchard, I would say.

Q. About what area in acres?

A. Oh, about eight acres.

Q. The other 36 acres away from the center, did you spray that just once, or more than once?

A. Just once.

Q. By what date did you finish the first spraying of the whole orchard?

A. I finished on the 27th day of February.

Q. And on what dates did you spray a second time this center portion of eight acres?

A. Eight acres.

Q. What were those dates?

(Testimony of Max Miller.)

A. The 28th of February and the 1st and 2nd of March.

Q. Now, what kind of a mixture was it that you were spraying on the trees in all that period?

A. I used a mixture of Bordeaux and lime.

Q. It was Bordeaux mixture in what proportions?

A. Well, we used 40 pounds of lime and 40 pounds of Bordeaux to 400 gallons of water.

Q. When you say 40 pounds of Bordeaux to 400 gallons of water, do you mean that blue-looking stuff?

A. Yes.

Q. That would be known as a 5-5-50 mixture, wouldn't it?

A. Yes, that is what we call a 5-5-50 mixture.

Q. Now, during all of those dates that you were spraying from the beginning to the end, ending, I think, on March 3, you have [590] told us—

A. March 2.

Q. March 2. —ending March 2, what was the condition of the trees with respect to buds or blossoms and the like?

A. Well—

Q. What stage had they reached?

A. The blossoms—what stage had the blossoms reached?

Q. If they had reached blossom. I want to know what period of life was reached then.

A. The bloom was in the pink in the early stages of the bloom—at the pink.

Q. Is that what is sometimes called pink bud?

A. Pink bud or popcorn stage, sometimes we call it.

(Testimony of Max Miller.)

Q. Pink bud or popcorn stage?

A. Yes, pink.

Q. Was or was not the orchard in white blossom at the time of the spraying?

A. No, it was not in white blossom, no.

Q. Subsequently to the completion of that spraying were you or not in the Pista orchard from time to time? A. Yes.

Q. Did you have some other activity around there? A. Yes.

Q. What was it?

A. I raised a crop of beans in '42 and '43 between the young trees. There is a portion in one end of the orchard there are young trees.

Q. In other words, outside of the 44 acres of bearing trees there is a new piece of reclaimed land along the Gabilan Creek where there are little trees? A. Yes.

Q. That is about how many acres?

A. I should say six.

Q. You were intercropping beans between those little apricot [591] trees? A. Yes.

Q. Is that correct? A. Yes.

Q. Now, from time to time as you were in that bean field of yours did you observe as to how long the white blossom period extended in the Pista apricot orchard? A. You mean in the apricots?

Q. Yes. A. You mean the white bloom?

Q. Yes.

A. Oh, I would say maybe three weeks.

Q. Beginning about what date?

(Testimony of Max Miller.)

A. Well, that would be after the spraying. It takes—you see, after the spraying it probably takes several days before they got into the full bloom. I would say—well, I finished the 2nd of March; I would say it would take several days; maybe around March 10 they would reach their full bloom stage. I am not positive.

Q. Beginning March 10 how long did the white blossoms last from then on?

A. Usually about three weeks.

Q. Now, from the time you began spraying in that Pista orchard on February 17, 1943—

A. Yes.

Q. —from there until the end of this white bloom period that you have mentioned, state whether or not dust from the Permanente stacks was falling on that orchard.

A. Yes, it was falling at certain times.

Q. Can you describe the appearance of it and the quantity of it in some way?

A. Well, that depended on the wind. If the wind was blowing toward the Pista ranch you could readily [592] see it coming; but if the wind was—the column was going straight up, it kind of come out more easy.

Q. State the frequency of wind from day to day from the stack over toward the Pista orchard during these dates we have mentioned.

A. Well, I didn't pay—I noticed every day I would see it sometime during the day coming towards the Pista ranch.

(Testimony of Max Miller.)

Q. Blowing from the stacks toward the Pista ranch? A. Yes.

Q. By the way, how many hours a day did you run your tractor?

A. Oh, some days ten; all the way from nine to ten hours a day.

Q. In the daytime?

A. In the daytime, yes.

Q. What was done with the tractor at night time?

A. Well, it stood idle; drove it up to the buildings and let it set there.

Q. Out in the open? A. Yes.

Q. How many hours would it be standing still at night out in the open?

A. Well, there would be about 12 or 14 hours —about 14 hours.

Q. In the morning when you came back after it had been standing for 14 hours, what if anything did you observe as to this Permanente dust on top of the tractor?

A. It could be readily seen if I brushed my hand on it.

Q. Could you describe the quantity of it as you looked at it and dusted it off, so that his Honor could understand what you mean?

A. It was all over the tractor. I would take my hand [593] and brush it. You would get dust on your hands.

Q. Was it simply spotted over the top of the tractor, or was it completely covered on the top of the tractor?

(Testimony of Max Miller.)

A. The top was covered. I wouldn't say it was spotted; I would say it would be uniform.

Q. Did you spray at any time when it was raining?

A. No, no, we don't spray in the rain.

Q. At the time when you were spraying did or did not any part of your tractor ever come in contact or collision with some part of a tree or branch and shake it? A. Well, yes, during—

Q. When that happened did or did not any dust fall from the trees?

A. Yes, especially later on when there was more foliage on the trees.

Q. Could you describe the apparent quantity of it to his Honor?

A. Well, later on, when there was more foliage out working in the orchard, the tractor coming in contact with a limb and gave it a kick, you would naturally knock that dust off, and I know it would get in my eyes and smart in my eyes.

Q. Well, it would make your eyes smart. Could you describe to his Honor some common substance that one gets in one's eyes at times that would feel like this substance?

Mr. Moore: Just a minute. Just a minute. I am going to object to the question as apparently leading right to start with.

Mr. Naus: That isn't leading. I am asking him to compare [594] the smarting with some common substance that we are all familiar with. I haven't named the substance.

(Testimony of Max Miller.)

Mr. Moore: I didn't understand the question. I withdraw my objection.

Mr. Naus: Q. Did you understand the question?

A. No, I did not.

Q. You say that when this Permanente dust came in your eyes, your eyes smarted?

A. Yes.

Q. I am asking you if you can think of any common substance that one gets in one's eyes as he goes through life that would make your eyes smart like this Permanente dust felt?

A. Well, I really don't know.

Q. If you can't, we will pass on. I just thought perhaps you might.

Now, did or did not this dust fall on your bean crop? A. Yes, it did.

Q. Had you or not grown the same kind of beans on the same ground the year before?

A. Yes.

Q. Over the same acreage? A. Yes.

Q. Was or was not your bean crop in 1943 as much or less or more than the one in 1942?

Mr. Moore: I am going to object to that as incompetent, irrelevant and immaterial. We would have to go into the horticulture of beans, because what might affect one particular vegetable or tree or something may be entirely different from [595] another.

Mr. Naus: I will withdraw the question, then, rather than prolong the case.

(Testimony of Max Miller.)

You may cross-examine.

Mr. Moore: No questions.

The Court: Step down.

(Discussion off the record.)

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#### F. E. TWINING

recalled in rebuttal; previously sworn.

##### Direct Examination

Mr. Naus: Q. Mr. Twining, since you left the stand last week you again visited the Pista orchard?

A. Yes.

Q. Currently, at the request of Mr. Harrington and myself? A. Yes.

Q. On what date most recently have you been in the Pista orchard? A. Day before yesterday.

Q. And at that time was or was not dust coming from the Permanente stack?

A. No, I don't think so. The kiln was not in operation; there was dust around the ground, but nothing from the stack.

Q. Did you or not test the recent deposit of dust in the Pista orchard from the Permanente stack to determine the presence or absence of any oxide?

A. Yes.

Q. Did you or not test day before yesterday right in the Pista [596] orchard itself recently fallen dust from the stack to determine the presence or absence of hydroxide?

(Testimony of F. E. Twining.)

A. Well, the alkalinity would be oxide and hydroxide.

Q. All right. Now, upon that actual examination right within the orchard of dust freshly fallen, what did you find with respect to the absence of oxides and hydroxides?

A. They were present in the dust.

Q. In the dust—you mean the Permanente dust?

A. Yes, that is, the dust on the trees and vegetation there.

Q. State from your inspection whether you can say one way or the other whether the Permanente dust—out of the Permanente stack—had fully carbonated by the time it landed on the Pista vegetation.

A. A considerable portion of it has not. It carbonates very slowly.

Q. Now, state just how you went about this test, what you as a chemist did to make the test.

A. On the original tests we determined that there was oxide and hydroxide present in the dust.

Mr. Moore: Just a minute. I thought you—I will withdraw my objection.

Mr. Naus: May we have the question read, your Honor?

The Court: Read the question.

(Question read.)

Mr. Naus: I mean this recent one day before yesterday.

A. We used indicators—certain indicators that show whether [597] the solution is alkaline.

(Testimony of F. E. Twining.)

The Court: Q. Tell us what they were.

A. We used phenol red and phenolphthalein, two different indicators I used.

Mr. Naus: Q. How were they used, Mr. Twining?

A. Well, they are the solutions that we add to a solution of the dust to determine whether it is an oxide or hydroxide. We make a watery solution, we use the indicators and from the color we know whether it is acid or alkaline.

Q. Then the chemical reaction is one of color, is it? A. That is right.

Q. What color did you get reacted there to determine the presence—

A. In both cases we get a red—deep red.

Q. By the way, there has been a reference earlier today to dropping hydrochloric acid on these dusted leaves. What, if anything can be determined as to the presence or absence of carbonate, oxide or hydroxide by putting a drop of hydrochloric acid on a leaf, a drop the size that comes out of an ordinary eye-dropper?

A. Dropping an acid on a carbonate produces an effervescence, and to the oxides and hydroxides there would be a little heat generated, but it wouldn't be apparent on such a small quantity of stuff. It would convert the oxide and hydroxide into chlorides, but it wouldn't be noticeable.

Q. State whether or not in the tests that you made in the fields as to recently fallen dust, the test you made a day or [598] two ago, whether the oxide

(Testimony of F. E. Twining.)

and hydroxide you found present was of a nature and a sufficient quantity to interfere with pollination and fertilization if dropped during the blooming period.

A. That would depend on the quantity, of course, and the amount of moisture present.

Mr. Naus: You may cross-examine.

#### Cross-Examination

Mr. Moore: Q. It was your opinion, Mr. Twining, when you rendered your original report on March 31, 1944, that there would be sufficient hydroxide or dioxide to interfere with the coming crop, is that correct?

A. Well, that dust on the or in the blossom would certainly affect it.

Q. Was that your opinion on March 31, 1944?

A. Not only my opinion, but actual knowledge.

Q. All right. In other words, I will read you from this: "It was shown that dust from the Permanente plant was being slowly deposited at time of investigation, March 14"—I assume that is March 14, 1944? A. That is right.

Q. "—and that damage to this year's crop will occur." A. Yes.

Q. And then the supplemental report of yours, I believe, states there wasn't any—May I have the supplemental report? I will ask you, Have you examined that orchard?

A. You mean since that date?

Q. Yes. A. Yes, I have examined it. [599]

(Testimony of F. E. Twining.)

Q. Are you of the opinion that there was damage to that crop in the year 1944?

A. I stated that the damage would be small, because the amount was very small.

Q. In other words, in your supplemental report after the harvest you state—you changed your mind practically and you say, "It is going to be rather difficult to assess the damages for this season for the crop is large and in fairly good shape."

A. That is when the crop had set. We couldn't tell on March 14 what sort of a crop it was.

Q. But you were of the opinion, then, that it would damage the crop?

A. Well, in my own experience over a period of years with dust of that type, I know that there would have been some damage.

Q. It was your opinion on March 14 it would damage the crop, is that correct?

A. That is right.

Q. Then after the harvesting you changed your mind and you say, "The crop is large and in fairly good shape?"

A. Yes; but I didn't say there wasn't any damage.

Q. All right. Now we come to your testimony that has just been given. You say when you were down there the kilns were not operating.

A. Tuesday.

Q. And yet you say you took freshly fallen dust.

A. Well, that may have been two or three weeks old. Sometimes it don't carbonate for months.

(Testimony of F. E. Twining.)

Q. Now, do I understand you—what do you mean by "carbonate?" [600]

A. I mean that it is—the hydroxide unites with carbon dioxide to form a carbonate. That may take a long time; it depends on the amount of carbon dioxide in the atmosphere and the condition of oxide or hydroxide.

Q. Well, very small particles of magnesium oxide or calcium oxide passing out in the form of dust, don't they start to carbonate the moment they come in contact with the air?

A. The moment they come in contact with carbon dioxide, of which there is a very small amount in the air.

Q. Will you please answer my question: Don't they commence to carbonate as soon as they come in contact with the air?

A. You might say "commence," yes.

Q. As a matter of fact, they commence going up the stack there even before they come in contact with the air? A. No, I think not.

Q. In other words, you disagree with Professor Duschak?

A. Not at a temperature of 900 or 1000 or more. There would be no use calcining it if it carbonated at those temperatures.

Q. I am asking you if they don't commence as they go up the stack. Don't they commence to pick up carbon dioxide?

A. Not at the stack temperatures.

Q. You are positive of that? A. Yes.

(Testimony of F. E. Twining.)

Q. Were you here and did you hear Dr. Duschak's testimony? A. No.

Q. In other words, when they come into the air they commence to [601] pick up carbon dioxide, is that true? A. Yes.

Q. And there is a very considerable amount of carbon dioxide in the air, is there not?

A. Not very much.

Q. Would you say one of these fine particles could take three or four months before it turned into a carbonate?

A. It would depend a lot on whether it was protected or not.

Q. What do you mean by "protected?"

A. If the dust happened to be rather heavy it could be protected.

Q. I am asking about the little particles flying through the air. Are they protected?

A. At that time we haven't enough carbon dioxide to react on that amount of dust.

Q. That would depend entirely upon how far they traveled, too, through the air?

A. The amount of carbon dioxide would have some bearing on the amount of carbonation, of course.

Q. Well, would that carbonation take place?

A. Carbonation would take place between the carbon dioxide and the particle.

Q. What part of the particle would first become carbonate? A. On the outside.

(Testimony of F. E. Twining.)

Q. As time went on that shell would harden, would it not? A. Yes.

Q. And that shell would be a neutral, then, would it not?

A. Well, the shell would of course—if it was a neutral carbonate it would be neutral.

Q. Wouldn't it be a neutral carbonate?

A. Not necessarily.

Q. What other kind of carbonate is there?

A. Bicarbonate [602] is alkaline.

Q. What would the shell be? Would it be carbonate, bicarbonate, or what kind of carbonate?

A. It might be either or both.

Q. What in your opinion happens when that little particle comes in contact with the air and picks up carbon dioxide?

A. It is first hydrated, and then due to the amount of exposure to carbon dioxide, it will slowly carbonate.

Q. Is that carbonate that would form as a shell neutral or not?

A. If it is entirely carbonate, it is neutral.

Q. If it is entirely carbonate? A. Yes.

Q. If that little deposit with an outside shell that is carbonate were deposited on the stigma of a plant, is it your opinion that that would kill fertilization?

A. Well, if it is entirely carbonate, it isn't very dangerous; it is more of a mechanical proposition, although if there was enough of it on a stigma, the secretion of which is acid, it might dissipate a cer-

(Testimony of F. E. Twining.)

tain amount of carbon dioxide and you would get an organic salt of lime or magnesia.

Q. In other words, it is your opinion that it possibly could?

A. It could cause some damage if there was enough of it.

Q. What is your Bordeaux mixture made out of?

A. The Bordeaux mixture is made of copper sulphate and hydroxide of lime.

Q. Calcium hydroxide? A. Yes. [603]

Q: Now, that is sprayed many times during the blossoming season, isn't it.

A. Well, it may be one or more times, yes.

Q. Doesn't that spray go into the blossom?

A. Yes; ordinarily they don't spray it right into the blossom.

Q. If they spray around the tree will you tell me how they are going to dodge the bloom if it is heavily laden with bloom?

A. Ordinarily that is before the blossoms open up.

Q. It isn't uncommon to spray while they are in bloom?

A. I might answer the question, if the blossom is open and the spray gets in there in sufficient quantity it will prevent pollinization.

Q. I will ask the question again: It isn't an uncommon practice to spray during blossom time?

A. Yes, with small amounts.

Q. What do you mean by "small amounts"?

A. That is weak solutions.

(Testimony of F. E. Twining.)

Q. At least we have a common ground. And that is when the tree is in bloom at times, isn't it?

A. I have known it to be used at times.

Q. What pressure is usually used to spray that tree?

A. Well, that might vary from an ordinary hand spray pump up to a power sprayer, three or four hundred pounds.

Q. What is the practice?

A. It depends a little bit on a man's orchard. Very large orchards, they have regular spraying equipment.

Q. Yes. This is sprayed on the tree with pressure in blossom [604] time, isn't it?

A. Sometimes, I say.

Q. Well, that is what I am getting at. I am speaking of that time. Why is it, then, with that sprayed in there in these blossoms under pressure that that calcium dioxide does not kill all the blossoms on the tree?

A. Well, there isn't enough of it, not enough soluble lime.

Q. It is a fact, is it not, that ordinarily after an apricot tree has been sprayed it looks almost like it was covered with snow—isn't that its general appearance? A. White or bluish color.

Q. Well, if you should ride by and notice it, it looks like it was covered with snow?

A. Ordinarily the Bordeaux mixture isn't white.

Q. But it gives that appearance, doesn't it?

A. Well, at a distance, yes.

(Testimony of F. E. Twining.)

Q. Ordinarily when they put the spray on they put it in thoroughly, don't they?

A. Supposed to.

Q. Then why is it that under those circumstances all the blossoms on the tree are not killed?

A. Because they don't get enough.

Q. But yet do I understand from you that this little drifting cloud of possibly or practically the same material that drifts gradually in there, in your opinion, it will kill the fruit?

A. Well, there is no question about it.

Q. That is your opinion?

A. Not my opinion; actual knowledge.

Q. Well, one will and one won't?

A. Well, I have seen [605] damage from spray.

Mr. Moore: That is all.

Mr. Naus: No further questions.

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### WILLIAM LEWIS

recalled in rebuttal; previously sworn.

#### Direct Examination

Mr. Naus: Q. Mr. Lewis, on your actual personal visits into the Pista orchard in the spring of 1943 and around blossom time in 1943, was there or not jacket rot present in that orchard?

A. To a very small extent. There were occasionally cots that I would find jacket rot on.

Q. Well, in describing the extent with respect

(Testimony of William Lewis.)

to the whole orchard of say 3,100 trees, can you define it in quantity?

A. I have got an estimate. I made an estimate including the Salinas area and the Prunedale of from one to two percent jacket rot in the year 1943.

Q. All right. Was the jacket rot in the Pista orchard in excess of that one to two percent in the county generally? A. No, it was not.

Q. Pardon my ignorance, but when you speak of one to two percent of jacket rot, does or does not that mean that 98 to 99 percent of the blossoms, cots, and the like are free from jacket rot?

A. That would mean that, yes.

Q. Now, I call your attention to Defendant's Exhibit O, the [606] Monterey County statistics for the years 1938 to 1943, both inclusive. You are familiar with them, are you?

A. Yes, I am on the fruit part of it. I compiled it myself.

Q. You are familiar with the part of these statistics that relates to apricots in Monterey County, are you? A. Yes, I am.

Q. Did you or not personally prepare the statistics? A. I did.

Q. As to apricots? Take the acreage, the producing acreage of apricots reported in there year by year, as producing a certain number of boxes. Is it correctly reported for each of the years?

A. The acreage—fruit acreage, tree acreage of Monterey County—I cannot give the date, but it was sometime around 1920 or before—1940, par-

(Testimony of William Lewis.)

don me on that '20 was compiled by the WPA, a U. S. project. From that time if an orchard was pulled or additional orchard added, it was allowed in that year's report. In 1943—the spring of 1943—the State Department sent a man in for to help out, and he checked the whole area to see whether we had taken out all the orchards that was pulled, whether we had eliminated orchards that should have been eliminated as non-bearing or as abandoned orchards, and if we added the orchards that came into bearing. From his figures and from the WPA figures—they are the figures that is used here with the exception of some of them years. From the time they compiled that the first time, any orchard that I knew was removed, I removed from the [607] acreage, or any orchard that I knew that came into bearing I added to the acreage, so the acreage would change from year to year.

Q. Now, when you testified before, you spoke about the general supervision you had over the Bardin orchard. In that Natividad-Alisal area was there any other apricot orchard over which you had supervision at the same time?

A. I believe I used the word "advice."

Q. Advice or whatever it was.

A. Since the spring of 1941 on the Bardin orchard I have been advising, and from the fall of 1941 I advised on the Anderson orchard. I have been called in a number of times on the Pista orchard for advice.

(Testimony of William Lewis.)

Q. Now, when you say the Anderson orchard, you mean the one named as such—

A. Leo Anderson.

Q. —in this photograph on Plaintiff's Exhibit 2?

A. Yes, I do.

Q. In keeping the Anderson and Bardin orchards under your personal observation in the year 1943 for the purpose of advising the respective growers and owners, is there any difference in condition between the Anderson and Bardin orchards thus observed by you other than the condition of Permanente dust?

Mr. Moore: I think that is objectionable, your Honor, not proper rebuttal. I don't know what he means by it. I object to it as not understandable. What do you mean?

Mr. Naus: I mean this, if the Court please—

Mr. Moore: The way the trees are planted, the number of feet between them? Just what do you mean?

Mr. Naus: Have you finished, Mr. Moore?

Mr. Moore: I say, I think that question is ambiguous.

Mr. Naus: I say, have you finished so I can make a complete statement?

Mr. Moore: Yes, I have finished.

Mr. Naus: I mean this—

The Court: I suggest you reframe your question.

Mr. Naus: Yes. Thank you, your Honor. And before framing it I will say that it was not until

(Testimony of William Lewis.)

after the witness had left the stand before that I learned for the first time, so far as I am personally concerned, that his attention he gave to the Bardin orchard was duplicated with respect to the Anderson orchard, so if there is any question of improper rebuttal, I will move to reopen for this one question.

Mr. Moore: All right. I won't object as long as we know it is that way.

Mr. Naus: Q. Now, Mr. Lewis, I will ask you whether or not, having in mind that you kept the two orchards, the Bardin and the Anderson orchard, under your personal supervision for the purpose of advising the respective growers through the years 1942 and 1943, do you know of any difference in any conditions affecting the development of a cot and the growing of an apricot in the year 1943 between the Bardin and the Anderson [609] orchards other than the difference that Permanente dust fell on one and didn't fall on the other?

A. No, I do not.

Mr. Naus: You may cross-examine.

#### Cross-Examination

Mr. Moore: Q. Mr. Lewis, what date did the blossoming take place on the Bardin orchard—commence?

A. I cannot give you the exact date.

Q. What date did it commence on the Anderson orchard?

A. Well, I couldn't give you the exact date on

(Testimony of William Lewis.)

that. I can give you an idea of how the different orchards came into bloom.

Q. With those two orchards, with regard to their blossoming period, was there any difference in the year 1943? A. The Anderson and the—

Q. And the Bardin?

A. —and the Bardin and the Bob Sterling—not the Bob, the Lester Sterling—came in practically the same time.

Q. Pista came in—

A. Came in about five days later.

Q. Did the blossoming on the Bardin continue for the same length as that on the Anderson?

A. Yes, it did.

Q. Now, the Wilmoth—when did it come in, do you know?

A. I can't give you on the Wilmoth either.

Q. Did it come in the same time as the—how far is it from the Anderson?

A. Well, I would estimate it about a mile and a half.

Q. About a mile and a half?

A. That is what I would [610] estimate it.

Q. Do you know whether or not it came in the same time as the Anderson?

A. No, I couldn't say on that.

Q. Do you know whether there was any deviation in the blossoming period of those two ranches?

A. No, I couldn't give you it now.

Q. Do you know what the yield was on the Wilmoth ranch?

(Testimony of William Lewis.)

A. I have an idea. I never got the yield from Mr. Wilmoth, but I have an idea on it. I made an estimate on that orchard. I was in it.

Q. It didn't have dust on it, did it?

A. I never saw any dust on the Wilmoth orchard.

Q. Now, taking those two ranches there a mile and a half apart—withdraw the question. Don't you know that the yield on the Wilmoth ranch was not more than the Pista ranch and not more than the Anderson ranch, and perhaps less than theirs?

A. Yes, I know that.

Q. It was less than those two?

A. I know that. That was my estimate.

Q. And what difference, then, was there between the Wilmoth ranch and the Anderson ranch on the one part—and the Anderson ranch and the Pista ranch on the other part, except one had dust and the other did not have dust in 1943?

A. I say, I did not see any dust on the Wilmoth.

Q. You said that so far as the Bardin ranch and the Anderson [611] ranch were concerned, conditions were identical except the Bardin ranch did not have dust and the Anderson ranch did have dust. A. Did have dust.

Q. Isn't it true that conditions on the Wilmoth ranch and on the Anderson ranch were identical except that the Wilmoth ranch did not have dust and the Anderson ranch had dust?

A. Yes, and a soil condition.

Q. Soil condition? A. Yes.

(Testimony of William Lewis.)

Q. There was a difference, then, on the Wilmoth ranch?

A. There was a difference in this way: In classifying orchards in Monterey County for making estimates, there are certain orchards you classify in a 10- to 12-ton crop; some you classify in an 8- to 10-ton crop; some you classify a 5-ton crop; some, as you go down, to 3 to 4.

Q. Which classification does the Wilmoth Ranch come in?

A. He comes in the 5 to 6-ton crop.

Q. Which does Pista come in?

A. He comes in about an 11-ton crop.

Q. Bardin comes in at about what?

A. 11.

Q. Anderson? A. 11 or 12. [612]

Q. But I am referring now to percentages. The percentage on this 5-ton Wilmoth ranch was less than the percentage on the Pista ranch, wasn't it, in 1943—the percentage of yield?

A. Yes, that would be less.

Mr. Naus: Objected to as ambiguous.

Mr. Moore: Normally, granting the yield was 5 tons—

A. Granting it was 5 tons, it would be less.

Q. What I am getting at, the short crops in all these orchards were about the same, were they not—same percentage of normal yield?

A. On the Anderson, on the Pista ranch, and on the Wilmoth?

(Testimony of William Lewis.)

Q. Yes. A. As far as you could estimate.

Q. With the Wilmoth probably the least of the three, is that correct? A. Yes.

Q. So, regardless of whether there were one ton, or five tons, or ten tons, or 12 tons, there was no difference so far as the yield in 1943 was concerned between the Wilmoth on the one side and the Bardin and the Anderson on the other, except—I don't mean Bardin—the Anderson and the Pista, except that on the Wilmoth ranch they did not have dust, and on the other two they did, is that correct?

A. Could I have that question read?

The Court: Read the question, Mr. Reporter.

(The reporter read the question.)

A. May I go back on an inspection after the third bloom on the Bardin ranch? [613]

Mr. Moore: Q. Can't you answer the question if there is a difference on those three ranches, the Wilmoth, on the one side, and the Pista and the Anderson on the other—will you tell us what that difference was, with the exception of dust on one—

A. I can't give you any difference on the crop. One hasn't got any dust and the other has dust—one is not supposed to have any dust. I haven't seen any dust on it, and the others have dust.

Q. But again I repeat, was there any difference than that? A. No, there wasn't.

Mr. Moore: That is all.

(Testimony of William Lewis.)

Redirect Examination

Mr. Naus. Q. Mr. Lewis, do you believe or don't you believe that the Permanente dust hurt the Anderson and Pista apricots?

Mr. Moore: I am going to object to that as incompetent, irrelevant, and immaterial, not proper rebuttal. I will withdraw it.

The Court: Do you understand that question? Read the question.

(The reporter read the question.)

A. May I go back to an inspection just after the bloom dropped on the different orchards?

The Court: You can answer that in your own way and then make any explanation you want. Read it again so—

A. The only way I can answer it is to draw a comparison upon my last inspection, your Honor, because I am not a chemist, [614] but I know some chemistry. I am not going to state that dust did that or did not.

The Court: Then you can't answer the question. You can answer it in any way you want. I don't want to prompt you how to answer it; but under our procedure, you are expected to answer the question as best you can, and then you can follow it by making any explanation you wish. If you want the reporter to read it again, you may have that done.

A. No, I will answer it just on an opinion that

(Testimony of William Lewis.)

there was damage on the Anderson orchard. Now, if I may follow up by explanation—

The Court: Q. On the Anderson—

Mr. Naus: The question extends to the Pista orchard also, your Honor.

A. On the Anderson and Pista orchards. Now, if I can follow up with an explanation of it?

The Court: Go ahead.

A. After this third cycle that I explained before of the bloom, I went to the Bardin orchard. It was shortly after them clear days. The white blossoms was practically all off, and Mrs. Bardin and myself went through the orchard. It was from my observations that I believed that that set or that third bloom was going to set, and I told her that she was going to get a crop; that she might have to thin part of the orchard.

I left the Bardin orchard and went to the Lester Sterling orchard. Lester Sterling and his foreman saw me there and they came out. I looked at the orchard, examined the orchard [615] with them. They didn't think they were going to have anything. I told them that they would have a crop; that they would have at least 80 tons.

From there I went to the Anderson orchard. I saw the condition looked the same on the Anderson orchard as it was on the Bardin and Sterling orchards. And I told Mr. Anderson, "Unless the dust"—those are my exact words: "Unless the dust damages you, you will have a crop." He says, "Will you tell that to my wife?"

(Testimony of William Lewis.)

I went from there to the Pista orchard, and from my observation it looked like the Pista orchard was going to set a crop. Now, that is how I drew my conclusions.

Mr. Naus: That is all.

Mr. Moore: No questions.

Mr. Naus: We rest.

Mr. Moore: We rest.

(Thereupon the case was submitted on briefs 15, 15 and 15, and continued to November 7, 1944, on the Court calendar.) [616]

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[Endorsed]: No. 11019. United States Circuit Court of Appeals for the Ninth Circuit. The Permanente Metals Corporation, a corporation, Appellant, vs. B. Pista and Marie Pista, Appellees. Transcript of Record. Upon Appeal from the District Court of the United States for the Northern District of California Southern Division.

Filed March 29, 1945.

PAUL P. O'BRIEN,

Clerk of the United States Circuit Court of Appeals for the Ninth Circuit.

United States Circuit Court of Appeals  
for the Ninth Circuit

No. 11019

THE PERMANENTE METALS CORPORATION,  
a corporation,

Appellant,  
vs.

B. PISTA and MARIE PISTA,

Appellees.

STATEMENT OF POINTS OF APPELLANT  
THE PERMANENTE METALS CORPORATION

Pursuant to the provisions of Paragraph 6 of Rule 19 of this Court, appellant above named files as a concise statement of the points on which it intends to rely on this appeal the following:

1. The evidence does not support that portion of the judgment awarding monetary damages in favor of appellees and against appellant.
2. The Court erred in finding that dust from appellant's operations caused damage to appellees' 1943 apricot crop.
3. The Court erred in finding that dust from appellant's operations caused the yield from appellees' 1943 apricot crop to be 133.475 tons less than it would otherwise have been.
4. The Court erred in approximating the damages suffered by appellees, in that there is no evidence which tends to prove or establish what pro-

portion of appellees' crop shortage was attributable to natural causes and what proportion, if any, was attributable to dust from appellant's operations.

5. The evidence does not support the following findings of fact:

(a) That portion of paragraph "III" of the findings of fact reading as follows:

"From the commencement of the operation, as aforesaid, in August, 1942, until a year thereafter, in August, 1943, said dust was discharged into the atmosphere at an average rate of approximately thirty-two tons daily."

(b) Paragraph "IV" of the findings of fact.

(c) Paragraph "V" of the findings of fact.

(d) That the finding of the Court that damage was proximately caused to the appellees' apricot crop in the year 1943 by reason of dust or other material deposited thereon as a result of the appellant's operation is unsupported by any evidence and is a mere guess, conjecture and surmise on the part of the Court based upon evidence which is itself mere guess, conjecture and surmise on the part of the witnesses.

6. The Court erred in the admission of the following evidence:

(a) Permitting the witness, Louis Pista, to testify as to his estimate of the number of tons of apricots he would have harvested in 1943 if no dust were deposited on his orchard (Reporter's Transcript, pages 20-21).

(b) Permitting the witness, F. E. Twining, to

testify as to his opinion or estimate of tonnage of the crop if dust had not fallen on the trees (Reporter's Transcript, pages 109-113).

(c) Permitting the witness, F. E. Twining, to testify that in his opinion dust settled in sufficient quantities to interfere with pollination (Reporter's Transcript, pages 159-162).

(d) The admission in evidence of that portion of Exhibit No. 4 stating conclusions and opinions of the witness, F. E. Twining.

(e) The admission in evidence of that part of Exhibit No. 5 containing opinions and conclusions of the witness, F. E. Twining.

(f) The evidence admitted purporting to prove that damage was proximately caused the appellees' apricot crop in the year 1943 by reason of the deposit of dust or other materials emanating from the appellant's operations is mere guess, conjecture and surmise and will not support a finding or conclusion that any loss of crop by the appellees was caused by any dust or other material emanating from the appellant's operations.

(g) The Court erred in permitting the witness, F. E. Twining, over the objection of the appellant, to answer a hypothetical question which question omitted any reference to the weather and climatic conditions existing during the pollination period in 1943; and the Court further erred in refusing to strike the witness' answer to said question.

(h) The Court erred in permitting the witness, F. E. Twining, over the objection of the appellant, to testify whether or not the dust which came out

of the stack of the appellant's calcining plant and which settled on the Pista orchard was in sufficient quantity to definitely prevent the fertilization or pollination of the apricot blossoms.

7. The Court erred in excluding from the evidence appellant's Exhibit "W".

8. There is a lack of evidence in that:

(a) The Court erred in approximating the damages suffered by the appellees for there is no evidence justifying an approximation of damages or proving or tending to prove that the loss of crop of the appellees in 1943 was the direct and proximate result of any tortious act on the part of the appellant.

(b) There is no evidence which proves or establishes or tends to prove and establish what portion, if any, of appellees' crop shortage was attributable to weather and what portion was attributable to the dust or other materials deposited on the orchard as a result of appellant's operations, and the conclusions of the Court that 40 per cent of appellees' crop shortage in the year 1943 was due to weather conditions and 50 per cent of appellees' crop shortage was due to appellant's operation is an arbitrary conclusion on the part of the Court and unsupported by any evidence whatsoever, and is the mere surmise, guess and conjecture of said Court.

(c) There is no evidence which proves or tends to prove what portion of the total crop shortage suffered by appellees was caused by the appellant's acts, and what portion of the injury was caused

by inclement weather conditions, and the Court, in the absence of evidence showing what proportion of the crop shortage was caused by each of the two causes, cannot approximate what portion was attributable to each and render a verdict on the basis of such an approximation.

Dated: April 4th, 1945.

THELEN, MERRIN, JOHNSON  
& BRIDGES  
COURTNEY L. MOORE  
Attorneys for Defendant and  
Appellant

Copy of the Within Statement of Points of Appellant received this.....day of April, 1945.

GEO. M. NAUS, BARDIN &  
HARRINGTON,  
Attorneys for Plaintiffs and  
Appellees

[Endorsed]: Filed April 4, 1945. Paul P. O'Brien, Clerk.

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[Title of Circuit Court of Appeals and Cause.]

STIPULATION RELATIVE TO THE PRINTING OF EXHIBITS IN THE PRINTED RECORD ON APPEAL

It is hereby stipulated by and between the parties hereto that the following exhibits be included in and printed as a part of the printed record on appeal, and that the balance of the exhibits introduced

in evidence be not printed and not made a part of the printed record because in the opinion of counsel, they have no bearing on the issues involved in the appeal:

#### Plaintiffs' Exhibits

1. Plaintiffs' Exhibit No. 4, being the Twining Report dated March 31, 1944, identified at page 89 and introduced in evidence at page 96 of the typewritten transcript.
2. Plaintiffs' Exhibit No. 5, being a supplement to the Twining Report, dated August 8, 1944, identified at page 9 and introduced in evidence at page 96 of the typewritten transcript.
3. Plaintiffs' Exhibit No. 8, being photographic copy of "The Effect of Dust from Cement Mills on the Setting of Fruit", identified at page 230 and introduced in evidence at page 285 of the typewritten transcript.

#### Defendant's Exhibits

1. Defendant's Exhibit "K", which is statistical data as to the amount of dust that is being emitted from the stacks at Natividad and referred to at page 231 of the typewritten transcript.
2. The following portions of Defendant's Exhibit "U", being an article by McDaniels and Hildebrand in regard to the effect of Bordeaux mixture on pollination, to-wit: the first paragraph of page 14, marked on the exhibit with the letter "B", and the first paragraph on page 21, continuing over and including the first line of page 22, marked on the exhibit with the letter "B-1".

3. The following portions of Defendant's Exhibit "V", being an article entitled, "Monilia Blossom Blight (Brown Rot) of Apricots", introduced in evidence at page 499 of the typewritten transcript, to-wit: that portion found at pages 40 and 41 and marked on the exhibit with the letter "A" and "A-1".

4. Defendant's Exhibit "N-1", introduced in evidence at page 519 of the typewritten transcript and which consists of page 42 of Defendant's Exhibit "N".

Dated: April 23rd, 1945.

THELEN, MARRIN, JOHNSON  
and BRIDGES

COURTNEY L. MOORE

Attorneys for Appellant

BARDIN & HARRINGTON

GEO. M. NAUS

Attorneys for Appellees

[Endorsed]: Filed May 3, 1945. Paul P. O'Brien,  
Clerk.

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[Title of Circuit Court of Appeals and Cause.]

**DESIGNATION OF RECORD ON APPEAL**

Appellant hereby designates, in accordance with Rule 75, those portions of the record, proceedings and evidence to be contained in the record on appeal, to-wit: The entire record, exclusive of the depositions and including those portions of various

exhibits, in accordance with the stipulation of the parties heretofore served and filed.

Dated: May 22nd, 1945.

THELEN, MARRIN, JOHNSON  
and BRIDGES  
COURTNEY L. MOORE  
Attorneys for Appellant

Copy of the Within Designation of Record on  
Appeal received this 22nd day of May, 1945.

GEORGE M. NAUS  
Attorney for Appellees

[Endorsed]: Filed May 23, 1945. Paul P.  
O'Brien, Clerk.

